Efcon®

Installation & User manual.
Sampling systems

Table of content **Page**

1.1 General 4
1.2 Application area 4,5
1.3 Transportation 5
1.4 System set-up 5, 6

2 Enclosure 6…12
2.1 Technical specifications 6, 7
2.2 Dimensions and parts 7, 8
2.3 Installation 8…10
2.3.1 Mechanical installation 8
2.3.2 Electric installation 9, 10
2.5 Maintenance 12
2.6 Trouble shooting 12

3 Controller Setting 11…19
3.1 Technical specifications 11
3.2 Operation explanation 11, 12
3.2.1 Sampling 12
3.2.2 Container distributor system 12, 13
3.2.3 Counter function 13
3.2.4 Alarm function 13
3.2.5 Sampling on programmed periods 13
3.2.6 Stop sampling after xx container changes 13
3.3 Manual operation 13, 14
3.4 Counter read out 14
3.5 Change sampler settings 14…19
3.5.1 Read out 14
3.5.2 Date / time 14
3.5.3 Sampling settings 15, 16
3.5.4.1 Time-/volume proportional sampling 17
3.5.4.2 Batch TPS (time proportional sampling) 17
3.5.5 Sampling interval 17
3.5.6 Distributor settings 18
3.5.7 Distributor time interval 18
3.5.8 Turning distributor after xx samples 18
3.5.9 Stop sampling when container is filled 18
3.5.10 Cool unit settings 18, 19
3.5.11 Sampling on programmed period/day interval 19, 20
3.5.12 Stop sampling after xx container changements 20
3.6 Change software 20

4 Vacuum sampler 21…24
4.1 Technical specifications 21
4.2 Measurements and parts 21
4.3 Principle of operation 22
4.4 Installation instructions 22, 23
4.5 Changing sample volume 23
4.6 Maintenance 23, 24
4.7 Trouble shooting 25

Table of Content

5	**ILS Guillotine G05 sampler**	**25…28**
5.1	Technical specifications	25
5.2	Measurements and parts	25
5.3	Principle of operation	26
5.4	Installation instructions	27
5.5	Changing sample volume	27
5.6	Maintenance	27
5.7	Trouble shooting	28
6	**ILS 2-way sampler**	**28…32**
6.1	Technical specifications	28
6.2	Measurements and parts	29
6.3	Principle of operation	29
6.4	Changing sample volume	30
6.5	Maintenance	31
6.6	Trouble shooting	32
7	**ILS 3-way SS sampler**	**32…36**
7.1	Technical specifications	32
7.2	Measurements and parts	33
7.3	Principle of operation	33
7.4	Installation instructions	34
7.5	Changing sample volume	34
7.6	Maintenance	35
7.7	Trouble shooting	36
8	**ILS 3-way PVC sampler**	**36…39**
8.1	Technical specifications	36
8.2	Measurements and parts	37
8.3	Principle of operation	37
8.4	Installation instructions	37, 38
8.5	Changing sample volume	39
8.6	Maintenance	39
8.7	Trouble shooting	39
9	**Peristaltic Sampler**	**40**
9.1	Technical specifications	40
9.2	Measurements and parts	40
9.3	Principle of operation	41
9.4	Installation instructions	41
9.5	Changing	42
9.6	Maintenance	42
9.7	Trouble shooting	43
9	**Spare parts**	**44**
10	**CE Declaration**	**45**

1.1 General

Efcon® is developed by A.V.M. / Netherlands as a complete **Ef**fluent **Con**trol Systems. Efcon® products are designed for measuring and controlling waste water flows.
Efcon® products fulfil to the tough Dutch regulations NEN 6600-1 and the international standards ISO 5667-2/3&10.

Products from the Efcon® program are:
Samplers (several types), level controllers, pump controllers, registration equipment, sample distributor systems, flowmeters industrial and sewers, measurement pit, cool units, mobile systems, etc.

BEFORE YOU START:
Read the manual before you connect the unit to a power supply or install.
In case of illegal use or use in non-defined area's any form of warranty will be denied. The user needs to be informed about the users manual and application dangers.

Installing and adjusting parameters of the sampling system should be done by qualified personnel .

Check if the equipment is transported without transport damage. In case of damage directly contact your supplier and do not install the equipment. The equipment is tested in the AVM factory in Hei- en Boeicop, Netherlands to different quality tests before it is transported. Required maintenance or repair, which will not influence the warranty period, will have to be done by trained Efcon® specialists. All equipment returned to AVM needs to be cleaned, sterilised and transported in a safe enclosure to avoid health-threatening situations. In case of service or repair, the equipment will not be accepted by AVM if there is no declaration of origin and safety added to the equipment. Extra cleaning can be refused or will be charged! Warranty will be denied if there are mechanical, electronic or software changes in the unit which are not performed by AVM.

BASIC WARRANTY PERIODS:
12 months after delivery for Efcon® equipment ex. Works used and installed according specifications, 150 samples and 24 distributor turns a day in a non aggressive well ventilated environment.
48 months for thermoplastic enclosures on stationair use according installation

1.2 Application area Efcon® equipment

Be aware! wrong application or misuse can damage the equipment or the surrounding of the unit and is not covered by any form of warranty.

Surrounding conditions:

- Temperature: 0°C / +40°C. (-25°C / + 55°C optional)
- Well ventilated space
- AVM advises not to place the enclosure into direct sun light, for an optimal cooler output. Systems in direct sun light cool less efficient due to a higher surrounding temperature!

Use in explosion hazardous environment is prohibited unless mentioned on product and manual!

Sample Medium:

- Free of solid parts (Guillotine excluded.)
- Free of air inclusion
- Temperature: +0,1°C / +50°C. (higher optional)
- Minimal conductivity: 50µS (only for vacuum systems)

1.3 Transportation

- Transport all systems equipped with a cool unit straight up.
- For warranty claims send the system packed in the original package and on the supplied pallet.

1.4 System set up

Efcon® sampling systems are available in different thermoplastic enclosures and are standard equipped with a SIEMENS logo controller. Efcon® sampling systems can be supplied in various operation principles, for different circumstances, according NEN 6600-1 & ISO 5667-2&10.

Standard enclosures:

- Efcon®omy *Monoblock:* On request in mobile available (with wheels and carry brackets),
- Efcon® *Industrial*: Industrial model with Plug-In-Cool unit. Bigger compartment for electronic components like recorders / measurement electronics / etc.
- Efcon® CarryBox: Portable enclosure for vacuum samplers without cooler,
- Efcon®omy SystemBox: Enclosure to build in flowmeters, samplers, air compressors etc. Combinable with Efcon®omy *Monoblock* enclosure.
- Efcon® *industrial* SystemBox: Enclosure to build in flowmeters, samplers, air compressors, CIP installations, switch boxes etc. Combinable with Efcon® *industrial* enclosure.

CPU's:

- Siemens LOGO: With basic functionality.
- On request custom made controllers.

Sampling principles:

- **Vacuum** principle: Suction system from open channels
- **In-line principle**: In-Line-Sampler (ILS) are suited for waste water sampling from 100% filled pipes and available in different types:
  - **ILS Guillotine**: pneumatic driven SS 316 sampler, for raw waste water.
  - ILS 3WP *22: pneumatic driven, SS 316 flush system for raw waste water, available in multiple diameters and pressure classes.
  - ILS 3WE *12: electric driven, cost-effective PVC flush system, with SS 316 sample bullet, available in multiple diameters and pressure classes.
  - ILS 2WE 412: electric , cost-effective PVC-sampler met RVS 316 sample bullet.

2 Efcon® omy enclosure

2.1 Technical specifications

Efcon®omy	
Electric:	
• Power supply / current	230V AC ±5% / 2,5 A / 50 Hz
• Power	± 400 W
Enclosure:	Thermoplastic Green (different colours optional)
• Height	• 1100 mm ± 2%
• Width	• 600 mm ± 2%
• Depth	• 600 mm ± 2%
• Material enclosure	• LLDPE double wall according AVM patent
• Material window	• Polycarbonate
• Material plates	• SS 316 / PE
• Isolation	• 40 tot 60 mm PUR foam
Surrounding conditions	
• Protection class	• IP 54/ Cool shaft IP23
• Ambient temperature	• (option -25°C) 0 / +40°C (optional +55°C)
• Direct sunrays	• Allowed, if possible avoid
• Zone	• Not in explosion hazardous environments.
Cooling characteristics :	
• Principle	• Forced 24VDC ventilator moist protected
• Coolant	• R134A
• Evaporator spiral	• Efcon® RVS 316 / V4A
• Compressor	• Electrolux coated
• Condenser	• Coated
• Cool temperature	• +3°C tot +5°C according NEN6600-ISO 5667
• Defrost cycle	• Automatic (adjustable on controller)
• Heater	• 24VDC-25W SS spiral (Option)
Sample container	Material Polyethylene – White (optional glass)
• without distributor	• from 2L till 50L
• with direct distributor	• 2x25L / 4x13,5L / 12x2L / 24x1L
• CE-Declaration	• Yes

Efcon® Carrybox (vacuum sampler)	
Electric :	
• Power supply / current	230V AC ±5% / 1 A / 50 Hz
• Power	± 100 W
Enclosure	Thermoplastic Green portable model
• Height	• 412 mm± 2%
• Width	• 340 mm ± 2%
• Depth	• 302 mm ±2%
• Weight	• ± 9 kg
• Material	• LLDPE
• Back plate	• Aluminium with suspension bracket
Surrounding conditions	
• Protection class	• IP 41
• Ambient temperature	• 0°C / +40°C
•Direct sunray	• Possible, if possible avoid
• Zone	• Not in explosion hazardous environments.

2.2 Measurements and parts

Efcon®omy enclosure

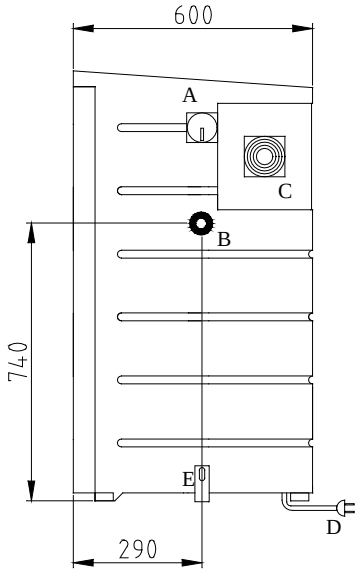
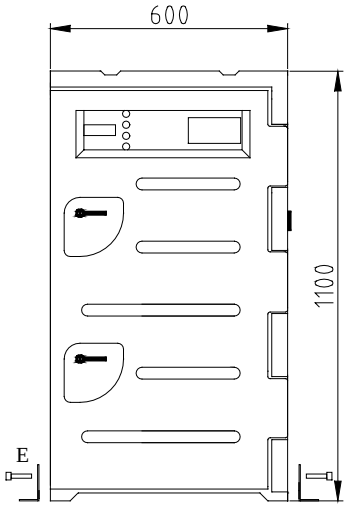
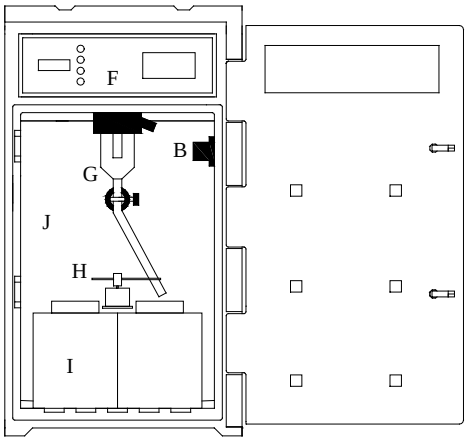


Fig. 2.2a





A) Main switch (left side standard)
B) Sample/suction hose inlet
C) Protect cover of the cool shaft
D) Power supply
E) Mounting brackets
F) Elektra front plate with buttons and display
G) Sample Garniture (only for vacuum systems)
H) Distributor engine with bracket
I) Sample container
J) Cooled sample storage compartment

Carry-Box Enclosure

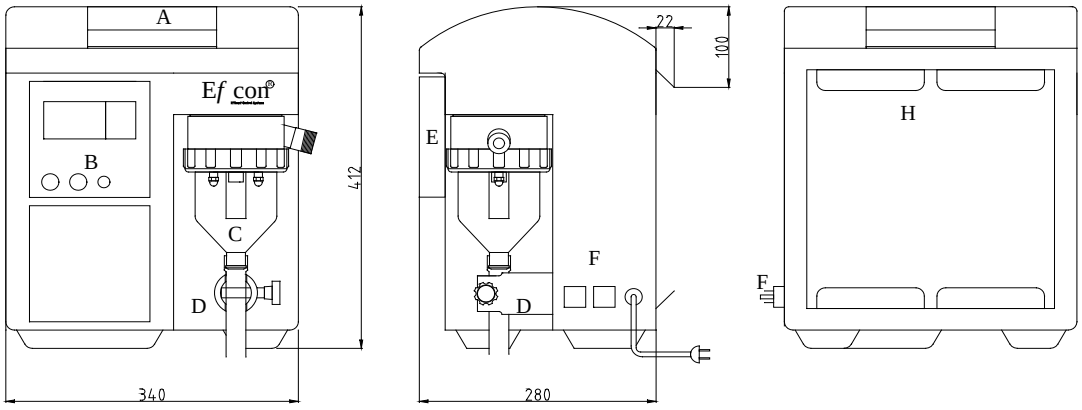


Fig. 2.2b

A) Handle
B) Operating panel
C) Vacuum chamber
D) Pincher
E) Splash board
F) Connectors
G) Power supply
H) Suspension bracket

2.3 Installation

2.3.1 Mechanical:

Before installing the enclosure, determine first where the sampler is placed (in case of an ILS systems). This way you can check if the sample hose (from sampler to enclosure) has an gradual slope.

Efcon®omy enclosure

Place the enclosure on a firm horizontal (water-levelled) ground and fix the enclosure with the two supplied SS mounting brackets, bolts en plugs. **BE CAREFULL!** When fastening the M6 bolt, don't fasten to hard in the enclosure.

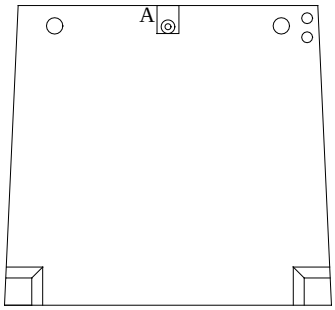


Fig. 2.3a

Beneath the enclosure a condensate drain outlet is fitted. The outlet has a push-in fitting for 8mm tubing. See fig. 2.3a

Carry enclosure

This enclosure is only available for vacuum samplers. Mount ±300 mm DIN-rail horizontal to the wall on which the enclosure is placed. Make sure there is sufficient height for an gradual, siphons free and nod free sample drain to the container.

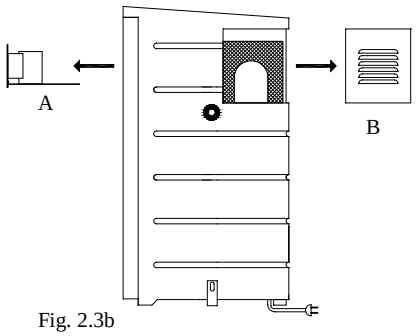


Fig. 2.3b

2.3.2 Electric:

Work as followed when installing the enclosure:

- Remove the protection cover (B in fig.2.3b) from the cool shaft by loosening the four bolts which hold the cover. If necessary remove the connector and earth cable from the fan on the cover to create more working space. Loosen the two grip nuts from the electro front plate (A in fig.2.3b). Unplug the connectors from the front plate to remove the plate from the enclosure

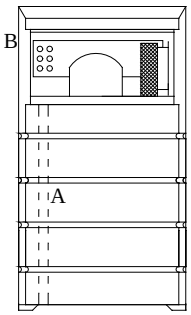


Fig. 2.3c

- Pull the connection cable through the cable tubes which run through the enclosure(A in Fig.2.3c).

- Pull the cable through the cable glands (B in fig.2.3c) on the separation plate between the cool shaft and electronic compartment. Strip the cables long enough to reach the terminal.

Terminal connections

Power supply

- Connect the power supply cable(230VAC/50Hz) to contacts 1 (ground), 2 (live) and 3 (null) of the terminal (see sticker in fig.2.3d).

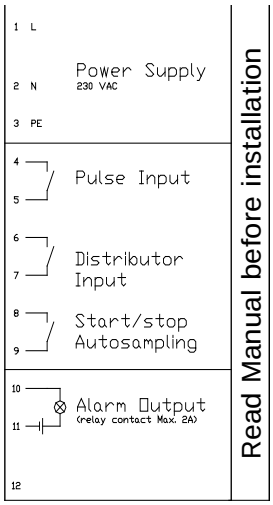


Fig. 2.3d

Pulse Input

- Connect the potential free pulse/batch contact to contacts 4 and 5. (pulse input) for pulse registration and pulse proportional sampling. When using the pulse input for batch control sampling, the pulse counter in the display counts every batch contact. Be ware: keep the pulse input frequency <1 Hz. Use a pulse length of ±100 msec.

Distributor input (optional)

- Connect a potential free contact to contact 6 and 7. By making contact on this input it's possible to activate the distributor externally.

- **Start /stop auto sampling input (optional)**
  Connect 8 & 9 to a potential contact to remotely start the automatic sampling program. The sampler will start the automatic sampling when the contact closes.

Alarm contact

- Connect the cable for the alarm relay contact to contacts 10 and 11 (alarm output).

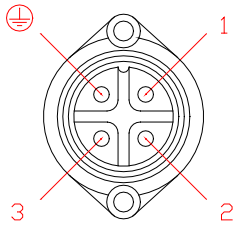


Fig.2.3e

In-/output Connectors (Optional)

Optional for Efcon® systems are connectors on the side available. Connect the pins of the connectors according fig 2.3d. Places the connectors with its cable inlet downward to prevent moisture inside the connector.

230VAC Power supply in (male connector)

- Pin 1 = L 230VAC 50Hz
  Pin 2 = N 230VAC 50Hz
  Pin PE= GND

24VDC Power supply in (female connector)

- Pin 1 = +24V DC
  Pin 2 = -24V DC (gnd)

Pulse Input (female connector)

- Pen 3 & PE= potential free contact

Distributor Input (female connector)

- Pen 3 & 2= potential free contact

Sampler Output (female connector)

- Pen 1= +24VDC sampler
- Pen 2= -24VDC sampler
- Pen 3= sampler response signal (24VDC pulse) optional

Alarm Output (male connector)

- Pen 1 & 2= Alarm output (potential free contact)

230VAC Power supply out (female connector)

- Pin 1 = L 230VAC 50Hz
  Pin 2 = N 230VAC 50Hz
  Pin PE= GND

2.4 Maintenance

BE AWARE! Before maintenance or revision switch off power supply, remove compressed air couplings and remove pressure and medium from waste water piping.

Maintenance and reparations should be done by qualified personnel.

Avoid direct contact with waste water, wear during use/maintenance/reparation protective gloves.

The maintenance frequency depends on and waste water characteristics. Clean (or replace if necessary) all parts which come in contact with the sampled medium regular

Check if the cool shaft of cooler is clean and is not clogged by dust . Cleaning the enclosure can be done with a moist cloth, but avoid all electrical parts.

Check yearly if the screws of all the electronic connection are tightened.

2.5 Trouble shooting

Problem	**Diagnose**	Solution
Cooler freezes the containers	Wrong settings controller Door not closed Door "leaks" air. 24VDC circuit out of range	Check setting (➔§1.7) Close door, check rubber seal of the door with a flash light. Adjust the potmeter on the power supply to 24,00VDC ±0,10 VDC.
Cooler doesn't cool	Wrong settings controller Fan inside the protection cover doesn't work	Check settings (➔§1.7) Check/replace fan
Distributor does not turn (properly)	Wrong distributor settings	Check settings (➔§1.7)
	Hex.bolt on the distributor engine is loose.	Fasten bolt
	Silicon hose doesn't turn free in rotation	Shorten silicone hose

3 Program settings

BE WARE! Faulty settings may lead to defect hardware. Adjusting parameter settings should be done by qualified personel.

3.1 Technical specifications

Siemens LOGO with display and operating buttons	
• I/O	• 8/12 of 4/8 output depends on type
• Internal real time Clock	• Yes, year, date, time
• Summer /winter time	• Yes, Automatic
• Time / volume proportional	• Sampling on time or volume (pulse) interval, or batch controlled time proportional sampling.
• Distributor turntime adjust.	• on time (3x), days of the week
• Container overflow protection	• Yes, adjustable
• Output Alarm error samples	
• Counters	• Yes, Pot. free relay contact - default 3 (adjust)
• Sampling on programmed periods	• Pulse total & Sample total • Yes, 2 programmable periods
Operating:	
• Pulse input	• 100 msec Pot. free contact, frequency <1Hz.
• Manual operation	• 4 push button: manual sample, next container, alarm reset, reset counters
• Changing setting	• On DISPLAY CPU in front of Efcon®omy Possible on display SIEMENS

3.2 Operation explanation

3.2.1 Sampling

Sampling system can take samples on three different principles:

- Manual sample, by pushing a button on the operation panel.
- Automatic sample, as programmed
  Time proportional sampling, Volume proportional (via pulse input) sampling or Batch Time proportional sampling (start time proportional sampling when the puls input is active).
- Automatic sample on programmed start- and stop date

3.2.2 Container distributor system (optional)

The distributor ensures a proper sample distribution across different sample containers.

Systems with multiple sample container are equipped with a direct distributor. The distributor positions the sample hose from the sampler (clockwise) above the container. This operates automatically (by program) of manually (by push button). The distributor is programmable to turn on:

- Fixed time (example: set on 10:00) & days (3 times a day).
- Time interval (example every 2 hours), time interval starts after programmed fixed time.
- After a number of taken samples, dependable on sample and container volume (overflow protection)*

* When the distributor turns manually the counted samples reset to zero.

3.2.3 Counter function (optional)

The Siemens LOGO-display show counted pulses and taken samples and stores up to 3 distributor rotations. These counters can be reset by the push button “reset counters” on front of the system.

Optional are mechanical counter (fixed and with reset) available which are placed in front.

3.2.4 Alarm function (optional for In Line Samplers)

After multiple sample failures or power failure the alarm output relay of the sampling system closes.

When a sample cycle is not completed the CPU registers an error sample. After a set number of error samples (default =3) the system stops taking automatic samples and switches to alarm condition. The alarm is perceptible on 2 ways:

- Alarm output relays switches
- Display describes current alarm status

Push the alarm-reset button in front of de enclosure to reset the alarm. After resetting the system will sample according program. Also when power failure accurse the alarm contact closes.

3.2.5 Sampling on programmed periods

By activating this setting it is possible to start and stop automatic sampling on a programmed date and time. This way the system can be programmed(➔§3.5.11) to only take samples.

- **Weekly,** example: only automatic volume proportional sampling every Friday from 08:00 till Saturday 08:00.
- **Period,** example: Monday 09:00 11th march 2006 start with automatic sampling. Monday 09:00 18 march 2006 stop automatic sampling.

3.2.6 Stop sampling after xx containers

When activated the sampler stops sampling after a programmed number of containers. By pushing reset the system samples further until the same number of samples is taken. ➔§3.5.12

3.3 Manual operation

The sampling system can be manually operated by four push button in front of the enclosure.

- **Manual Sample**, push to take an manual sample.
- **Next Bottle,** push to turn the distributor to the next container.

The distributor will wait 20 seconds when a sample is taken, to finish the sample cycle.

- **Reset Counters**, push to reset counters.
  Reset alarm, if the alarm is activated (to many error samples), push this button to reset the alarm.

The automatic sampling is controlled by a Siemens LOGO, placed in the front behind a splash cover. Push de 2 closing lips with thumb en point finger to open the cover and access the Siemens LOGO to change settings.

3.4 Read out

When the sampling system is not equipped with a distribution system the display shows a pulse and sample counter.

Sampling systems equipped with a container distribution system store, when the distributor turns, counted pulses and samples. The display of the Siemens LOGO registers counters of the last 3 distributor turns.

3.5 Changing Sampler settings(siemens CPU)

To change settings it is necessary to enter the program of the SIEMENS LOGO!

⚠ **Be aware! : When entering the program menu, don't erase the program from the cartridge.**

3.5.1 Changing displays

By pushing the cursor buttons next to the display it's possible to toggel between counter read outs. By pushing ↑ or ↓ the display switches from pulse counters to sample counters.

Only from the date/time display with the escape button it is ossible to enter the parameters

3.5.2 Changing date/time

- Select date/time display & press **ESC.**
- Select *Settings* with ↓.
- Select *clock* with ↓.
- Press **OK** to select
- Change date/time with the cursor buttons. Select the digit to change with ← and →, change the digit with ↑ or ↓.
- Press **OK** to store changed values.
- Press **ESC** to return to the date/time display.

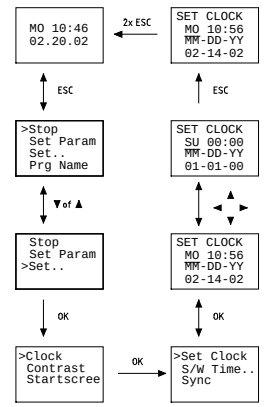


Fig. 3.5a

After power failure short then 48 hours the SIEMENS logo will keep its date/time, after a longer period it is possible these settings need to be adjusted. Thee clock function switches automatically between summer and winter time.

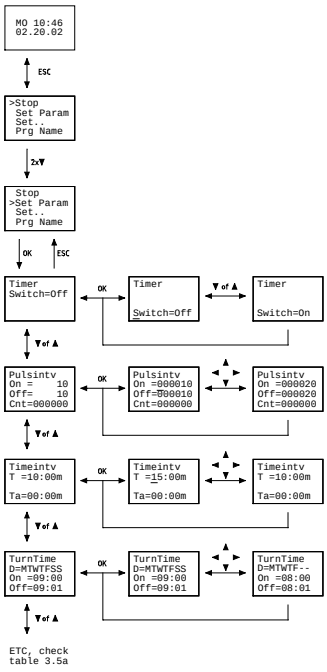


Fig. 3.5b

3.5.3 Changing sampling settings

- Select date/time display and press **ESC .**
- Select *Set Param* with ↓.
- Press **OK** to select.
- Select the Parameter to change with ↑ or ↓ and press **OK** to select.
- Select the digit to change with ← en →, change the digit with ↑ or ↓. See table 3.5 for a parameter summary.
- Press **OK** to store changed values.
- Press **ESC** to return to date/time display.

Software for SL1xxxxx & SL2/3/4/5/6xxxxxx		
Parameter	**Description**	**Default**
Timer	Choose time of pulse proportional automatic sampling Off= Pulse proportional program On = Time proportional program	Timer Switch off
PulsIntv (1&2)	Choose sample interval when sampling pulse proportional automatic sampling On = fill in desire pulse interval Off= confirm with same value Cnt= actual number of pulses since last taken sample. STV= Start Value (keep on 000000), (**don't change!)**	pulsintv On = 10 Off= 10 Cnt= 0 STV=0
TimeIntv	Choose sample interval when sampling time proportional T = fill in desired time interval Ta= actual time since last taken sample	timeintv T = 15:00m Ta= 00:00m
BatchTPS	Use pulse input for time proportional sampling when the input is closed. Off = normal pulse proportional sampling On = Time proportional sampling when pulse input is closed	BatchTPS Switch =Off
TurnTime 1,2,3	Distributor turn time (3x) MTWTFSS = Remove days when the distributor doesn't move ON = fill in desired turn time OFF = fill in ON-time + 1 minute	turntime MTWTFZZ ON= 08:00 OFF=08:00
TurnTime 4	**Don't change this setting** Pulse = Off	TurnTime 4 Pulse = Off
TurnIntv	Distributor time interval on-off On = Time interval on Off= Time interval off	TurnIntv Switch = off
TurnIntv	Adjustable time interval distributor, use parameter TurnTime to time the start of the interval T = fill in desired time interval Ta= Actual interval timer	TurnIntv T = 24 Ta= 24
OverFlow 1 & 2	Turn distributor after xx taken samples. Calculate *container volume / sample volume* and fill in value minus ± 5% for overflow protection. On = Fill in maximum number of sample Off = Confirm with same value Cnt = Actual number of samples in current container STV= Start Value (keep on 000000), (**don't change!)**	Overflow On = 240 Off= 240 Cnt= 0 STV= 0
ContFull	Set to stop sampling when the container is has reached the number of samples entered in the Overflow parameter. **Only for 1 container systems.** Off= Continuously sampling On = Stop sampling when parameter Overflow is reached.	ContFull Switch=Of
TurnStep 1 & 2	Number of distributor steps till next container. Fill in 24 / number of containers. On = fill in desired value (6 for a 4 container system) Off= confirm with same value Cnt= Actual number of of steps STV= Start Value (keep on 000000), (**don't change!)**	TurnStep On = 6 Off= 6 Cnt= 0 STV= 0
Errormax 1&2	Maximum number of error samples On = Fill in maximum number of allowed consecutive error samples (**don't fill in 0**) Off = Confirm with same value Cnt = Actual number of error samples STV= Start Value (keep on 000000), (**don't change!)**	Errormax On = 3 Off= 3 Cnt= 0 STV= 0

Purge	Purge time T = fill in desired Purge time Ta= actual value of Purge timer	Purge T =10:00s Ta= 00:00s
Suction	Maximum suction time. T = fill in maximum Ta= actual suction time	Suction T =30:00s Ta=00:00s
Dose	Dose time T = fill in desired dose time Ta= actual dose timer	Dose T =10:00s Ta= 00:00s
OpenBlow	Select if the sampler needs to create pressure during the release of the sample. On= Create pressure during sample release Off= Don't create pressure during sample release	OpenBlow Switch=On
RinseT	Rinse time: Time to clear the water from the tubing and suction-hose after dosing. For peristaltic pumps only. T = fill in the needed rinse time Ta= actual rinse timer	RinseT T =10:00s Ta=00:00s
ContactT	Activation time sampler. For pneumatic samplers default 3 sec. For electric samplers default 16 sec. T = Fill in the needed activation time (+flush time). Ta= Actual timer	ContactT T = 03:00s Ta= 00:00s
Response (optional)	Sampler equipped with response contact On = Response contact on Off= Response contact off	Response Switch=off
CoolUnit	Cool Unit set points On = Set point high (5 °C) Off = Set point low (2° C) Ax = Current temperature inside sample storage compartment	CoolUnit On = 5 Off= 2 Ax= 0
Heater	Heater set points On = Set point high (1 °C) Off = Set point low (0° C) Ax = Current temperature inside sample storage compartment	Heater On = 1 Off= 0 Ax= 0
Delay C	Delay time Cool unit, T = Delay time for Ta= Time passed	Delay C T = 60:00 s
Defr.Cyc	Defrost cycle, with this interval the cool unit stops automatically to defrost. TH = Defrost interval TL = Defrost time (time the cool unit switches off) Ta = Actual time interval timer	Defr.Cyc TH = 03:00h TL = 15:00m Ta = 00:00
CoolSamp	Start cool unit on the first taken sample, reset by reset buttons. On = Cool when sampling Off= Continuous cooling	CoolSamp Switch=Off
Defrost	Manual defrost function, On = Stop cool unit to defrost Off= Continue cooling	Defrost Switch=Off
ECO Cool	ECO cool function, when equipped with a door switch the sampler turn the cool unit off after the door is opened. On= cool unit doesn't stop after door opening Off= cool unit turn off after door opening	ECO Cool Switch=- Off
ECODelay	ECO cool delay, delay time tostop the cool unit after the door has been openend. T = delay time Ta= Actual time	ECODelay T = 09:00h Ta= 00:00h
Program	Start and Stop program On = Start and stop program active Off= Continuous sampling	ST/STP Switch=Off
Program1	Time start automatic sampling MTWTFSS = don't change On = Start time Off= Start time +1 minute Start-T 2 and 3 don't use	Start-T 1 MTWTFSS On = 08:00 Off= 08:01
Program 4	**Don't change this setting** , it should be set to: Pulse = Off	Start-T 4 Pulse = Off
ProgramD 1	Start date automatic sampling, when ST/STP is ON. Yearly= **don't change!** Keep **on** Monthly= **don't change!** Keep **off** Pulse= **don't change**! Keep **off**	Start –D1 1 Yearly= On Monthly= Off Pulse= Off
ProgramD 2	On = Fill in desired start date	Start-D1 2 ON: YYYY-MM-DD 2000-01-01
ProgramD 3	Off= Fill in desired start date + one day (keep the on 2099)	Start-D1 3

		OFF: YYYY-MM-DD 2099-01-01
StopCont 1	Stop continuous sampling after xx containers On = Fill in when the sampler needs to stop auto sampling Off= Confirm with same value Cnt= Actual number of sampled bottles	StopCont On = 24 Off= 24 Cnt= 0
StopCont 2	STV= Start Value (keep on 000000), **don't change**	StopCont 2 STV= 0
VS / ILS	Sample principle, select how the sampler should take a sample. Beware don't change Switch= OFF for vacuum samplers (don't change) Switch= ON for ILS samplers (Don't change)	VS / ILS Switch= Off

Table 3.5 "Software settings Vacuum systems"
Parameters with a orange background only for vacuum systems
Parameters with a green background only for ILS systems

- Special software of on request available.

3.5.4.1 Time/volume proportional sampling

- Select *Set Param*
- Press ↓ to select parameter *Timer* and press **OK.**
- Press ↑ or ↓ to switch from **ON** (Time proportional) or **OFF** (volume proportional).
- Press **OK** to store changes.

3.5.4.2 Batch TPS (time proportional sampling)

- Select *Set Param*
- Press ↓ to select parameter *BatchTPS* and press **OK.**
- Press ↑ or ↓ to switch from **ON** (Time proportional) or **OFF** (volume proportional).
- Press **OK** to store changes.

3.5.5 Changing sample interval

For volume proportional:

- Select *Set Param.*
- Press ↓ to select PulsIntv and press **OK.**
- Fill in next to *On* the desired pulse interval and confirm this value next to *Off*. Select the digit to change by pressing ← or →, change the digit with ↑ or ↓.
- Press **OK** to store changes.

For time proportional sampling

- Select *Set Param.*
- Press ↓ to select TimeIntv and press **OK.**
- Fill in next to *On* the desired pulse interval and confirm this value next to *Off*. Select the digit to change by pressing ← or →, change the digit with ↑ or ↓.
- Press **OK** to store changes.

3.5.6 Distributor turn time:

- Select *Set Param*
- Press ↓ to select parameter *TurnTime* and press **OK.**
- Select which day the distributor needs to turn (*SMTWTFS* for Sunday till Saturday). Fill in next to *On* the desired turn time (example 09:00 hours). Fill in next to *Off* the same time + 1 minute (on = 09:00, off = 09:01).
- Press **OK** to store changed values.

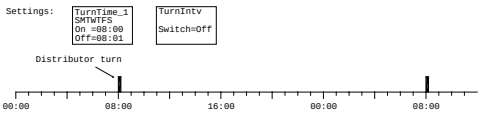


Fig. 3.5.c

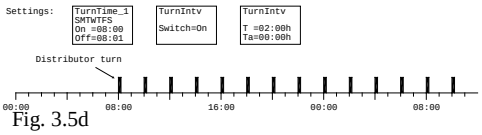


Fig. 3.5d

3.5.7 Distributor time interval

- Select *Set Param*
- First enter the time the interval starts with parameter *TurnTime*. See fig. 3.5c
- Press ↓ to select *TurnIntv* and press **OK.** Set switch to **On** by pressing ↑, to activate the turn interval. Press **OK** to store.
- Press ↑ to select the other *TurnIntv* parameter and press **OK**. Enter the desired interval with ← and →, ↑ or ↓.
- Press **OK** to store changed values.

3.5.8 Distributor turn after xx samples

- Select *Set Param*
- Press ↓ to select parameter *Overflow* and press **OK.**
- Select the digit to change with ← and →, change digit with ↑ or ↓. Fill in the maximum number of sample for each container next *On* confirm this value by entering the same value next to *Off*.
- Press **OK** to store changed values.

3.5.9 Stop sampling when container is filled

With this parameter the sampler stops sampling when a certain number (Overflow parameter) are taken. When the number is reached the sampler stops until the "Counter reset button" is pushed.

- Select *Set Param*
- Press ↑ to select *ContFull* and press **OK.**
- Press ↓ to change switch = On
- Press **OK** to store
- Select parameter *Overflow*
- Fill in the maximum number of samples in parameter Overflow.

3.5.10 Temperature settings

The coolunit settings such as setpoints for cooling, heating and defrost settings can be changed with the SIEMENS LOGO!.

Changing setpoints coolunit

- Select *Set Param.*
- Press ↓ to select *CoolUnit* and press **OK.**

- Fill in next to *On* the desired temperature to start the coolunit (set point high). Next to *Off* fill in the desired temperature to stop the cool unit (set point low).
- Press **OK** to store changes.

Changing cool unit delay time
To change the delay time go to parameter *Delay C*.

Changing set points heater
- Select *Set Param.*
- Press ↓ to select *Heater* and press **OK.**
- Fill in next to *On* the desired temperature to start the heater. Next to *Off* fill in the same -1°C.
- Press **OK** to store changes.

Defrost settings
The sampler is default set to defrost every 3 hours for 15 minutes. This keeps the cool unit from forming ice on the evaporator inside the unit. To change this go to parameter *Defr.Cyc* (deforst cycle). To manually switch the cool unit off (for defrosting period over a longer time) go to setting *Defrost* and set the switch to **ON**.

Start cool unit when first sample is taken
To have the cool unit switch off when no samples are taken, set parameter *CoolSamp* to **switch= ON**. Now the sampler starts cooling when the first sample is taken. To switch the coolunit off press **Reset Counters.** When parameter Coolsamp is set to switch=Off the sampler starts cooling continuously.

3.5.11 Sampling on programmed period/day
Automatic sampling from start date till stop date
- Select *Set Param* and Press ↑ to select *ST/STP*, press **OK.**
- Press ↑ to set switch to *On* and press **OK**.
- Press ↑ to select parameter *Start-D1*, press **OK**.
- Enter next to *On* with ←, →, ↑ and ↓ the desired start date. Enter next to *Off* the desired stop date. Press **OK** to store.
- Press ↑ to select parameter Start-T, press **OK**
- Fill in next to *On* the desired start time and press **OK.** Fill in next to Off the same time + 1 minute. Press **OK**.
- Press ↑ to select parameter Stop-D1, press **OK**.
- Fill in next to *On* the desired stop date, fill in next to off the same date + 1 day and press **OK**.
- Press ↑ to select parameter Stop-T, press **OK.**
- Fill in next to *On* the desired stop time and press **OK.** Fill in next to Off the same time + 1 minute. Press **OK**.

Press the reset counters button after programming the sampler to ensure the sample program is stoped!

Sampling only several hours a day

- Select *Set Param*
- Press ↑ to select parameter *ST/STP* , press **OK.**
- Set with ↑ the switch on *ON* and press **OK**.
- Press ↑ to select parameter *Start-D1*, press **OK**.
- Set *ON= 1-1* in, Set *Off= 12-31* and press **OK**.
- Press ↑ to select parameter *Start-T*, press **OK**
- Determine with letters from the 2nd row which day there should be sampled. Fill in the desired start time at *On*. Fill in the desired stop time at *Off* and press **OK.**.
- Press ↑ to select parameter *Stop-D1*, press **OK**.
- Set ON to 1-1, set Off to 12-31 and press **OK**.
- Select parameter *Stop-T* and press **OK**.
- For *On* fill in the desired stop time +1 minute. Fill in next to *Off* stop time + 1 minute and press **OK**.

3.5.12 Stop sampling after xx container changements

To stop the sampler from autosampling after a set number of container changements.

- Select *Set Param*
- Press ↑ to select parameter *StopCont*, press **OK.**
- Set with ↑ the switch on *ON* and press **OK**.
- Press ↑ to select parameter StopCont, press **OK**.
- Determine after how many container changements the sampler needs to stop autosampling. Fill in the desired amount after *On*. Confirm this after Off with the same value and press **OK.**

3.6 Changing software

If the software needs to be changed, the program cartridge needs to be replaced.

1) Remove power supply
2) Remove the old program cartridge carefully from the Siemens LOGO with a flat head plier or small plat head screwdriver.
3) Place the new program cartridge.
4) Restore power supply

4 Vacuum sampler

4.1 Technical Specifications

Vacuum sampler conform ISO 5667-2&10 en NEN 6600-1	
Sample principle	Principle Vacuum suction
• Max. suction height	• 4 meter (optional 6)
• Minimal suction speed	• 0,5 m/sec
• Air pump	• 24 VDC bi - directional ± 2800 rpm
• Pincher	• 24 VDC bi - directional ± 30 Nm with Amplimiter.
• Sample volume	• 20 ml tot 250 ml adjustable, 50 ml prefab
• Repeatability	• 2% (at 50ml and more)
• Dose accuracy	• 4% (at 50ml and more)
• Medium temperature	• max 50°C (higher on request)
• Max. sample frequency	• 1 sample / 2 minutes (software blocked)
• Diameter suction hose	• 16 mm (minimal 12mm) inside
• Coupling suction hose	• 3/4”
• Material vacuum chamber	• Polycarbonate
• Sample settings	• Adjustable purge, suction time out, dose time

4.2 Measurements and parts

Hardware of the vacuum sampler is located in the sample storage compartment, with exception of the air pump.

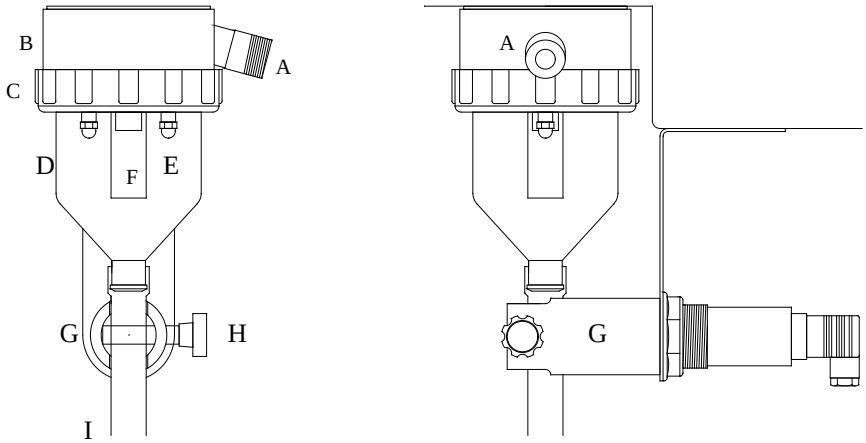
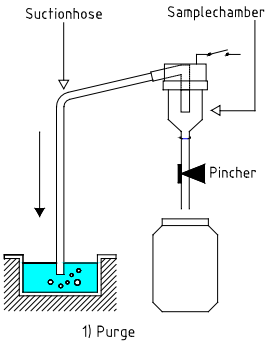
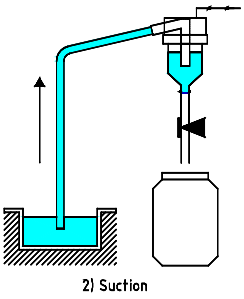
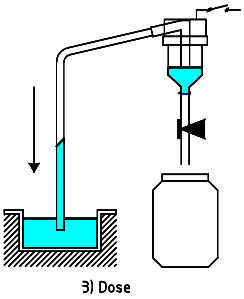


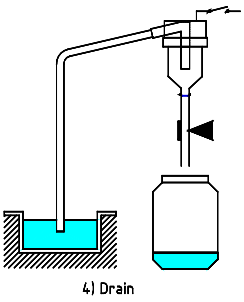
Fig. 4.2a

A) Coupling suction hose
B) Vacuum head
C) PP glass holder
D) Vacuum glass
E) Contact pins
F) Sample volume hose
G) Pincher
H) Pincher nut / bolt
I) Sample drain hose









4.3 Operation principle

The sampling cycle from a vacuum sampler:

- **CLOSING PINCHER**, the pincher squeezes the silicone hose air tight. **PURGE**, de air pump starts and generates pressure in the sample chamber. From the end (inlet) of the suction hose will escape air bubble. Which is a sign the "old waste water" has left the suction hose.
- **SUCTION**, the air pump changes rotation and a vacuum is created inside the sample chamber. Waste water will be sucked up through the suction hose until it reaches the level pins. If the pins aren't reached within a programmed time (**default 30 sec**) the sampling system will count a error sample and will wait until the next sample must be taken. After (**default setting) 3** error samples the sampling system will switch in alarm.
- **DOSE**, The SIEMENS level switch changes the rotation direction of the pump. This creates pressure in the sample chamber and will blow the excess volume back through the suction hose. After a short period(**default 10 sec**) air bubbles escape from the end (inlet) of the suction hose.
- **PINCHER OPEN**, the pincher opens and the sample will drop to the container. After several seconds the air pump stops and the cycle is complete. The sampler waits the minimum of 1 minute (due to cooling period air pump) till the next automatic sample is taken.

* All vacuum samplers have a 1 minute pause time between two taken samples, this to give the airpump time to rest/cool.

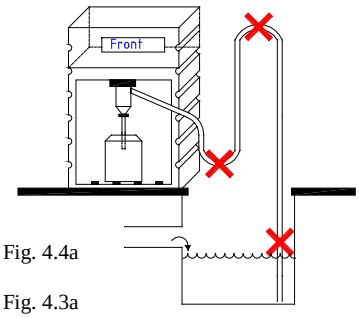


Fig. 4.4a

Fig. 4.3a

4.4 Installation instructions

Follow the following procedures during installation

- Connect the suction hose to the supplied suction hose coupling. Feed the hose through the inlet and fasten the gland air tight.
- Mount the end (inlet) of the suction hose on a fixed representative turbulent point to sample homogeneous waste water. Ensure the suction hose is always emerged in the waste water/medium.

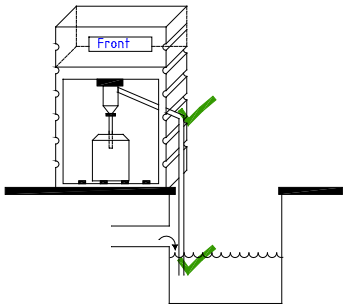


Fig. 4.4b

Keep in mind:

- Maximum suction height: 4 meter
- Maximum suction length: 20 meter
- Avoid siphons in the suction hose
- Mount the end (inlet) from the suction hose always downward and on a lower point then the sample chamber.

4.5 Changing sample volume

With vacuum systems the sample volume is adjustable by the length of the silicon hose (3 in Fig. 4.5a) inside the vacuum chamber (4). The longer the hose the smaller the sample volume. Standard sample volume is ± 50 cc, to change follow the following procedures.

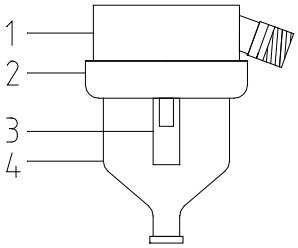


Fig. 4.5a

- Disconnect power supply
- Carefully loosen the PP glass holder(2) counter clockwise until the glass(4) is loose from the vacuum head
- If necessary remove the white bolt from the pincher to create more working space.
- Determine the length of the silicon hose (3) (lengthen or shorten)
- Reassembly the parts and connect power supply.

4.6 Maintenance Vacuum samplers

Be aware! Remove power supply, compressed air supply and medium pressure before maintenance or reparations.

Maintenance en reparations should be done by qualified personnel.

Avoid direct contact with waste water/medium, wear during use/maintenance/reparation of the sampler protective gloves

LET OP! When removing the sample drain hose from the pincher the danger of fingers entering the pincher accurse, this can cause serious injuries.

Points of attention Vacuum samplers

- Clean the inside of the vacuum chamber.
- Check if the silicone sample hose is intact and replace if necessary.
- Check regular if the suction hose is clean and intact, replace if necessary.
- Regular check the air pump capacity.
- Check if the power supply is 24 ± 0,1VDC

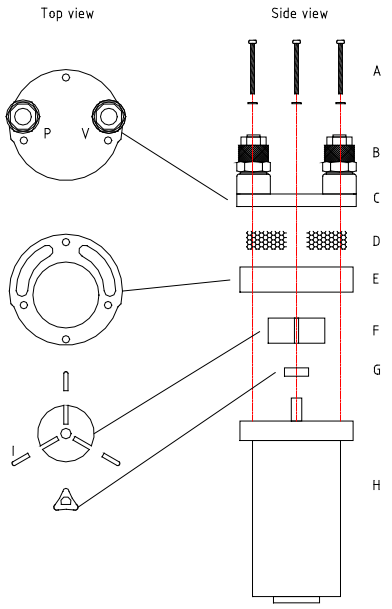


Fig. 4.6a

Revision Vacuum samplers

When the capacity of the air pump decreases, the filters inside the pump need to be cleaned. Remove the pump from the electronic compartment. Loosen the four M4 bolts from the pump head and en remove the 2 filters(D) from the pump head. Clean the filters with tap water and let them dry. **Be aware!**, reassemble the pump exactly as seen in fig 4.6a.

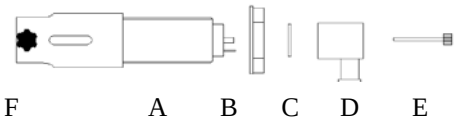


Fig. 4.6b

Replacing pincher

- Remove power supply
- Loosen the connector bolt (E) from the pincher connector (D) by hand. Remove the white bolt(F) which holds the silicon hose and loosen the nut (B) from the enclosure (A).
- Remove the pincher and replace the new pincher.
- Place the connectorseal(C) and connector(D) and fasten the connector bolt(E) (**Be ware! seal air tight.**).
- Place de white bolt back in it´s position.
- Connect the power supply, check if the pincher works accordingly.

4.7 Trouble shooting

Problem	**Diagnose**	Solution
Sampler doesn't take any samples	Check sampling settings	➔§3.5
	End of suction hose not emerged	See installation instructions (➔§4.3)
	PP glass holder loose	Fasten glass holder
	Coupling suction hose leaks air	Fasten/replace coupling suction hose/ replace o-ring
	Air pump not enough power	Check pump filters and rotor blocks(➔§4.6)
	Pincher doesn't fully pinch the silicon hose.	Adjust the potmeter on the power supply to 24 ± 0,10 VDC.
	To high pulse frequency	Max. puls frequency : < 1 pulse / second.
Air pump rotates but doesn't blow air.	Rotor block inside pump is broken / worn down	Replace rotor block (➔§4.6)
Sampler skips suction	Polluted Pins inside sample chamber	Clean all wetted parts inside the sample chamber.
Low sample volume	Sample volume to low adjusted	Lengthen silicon hose (➔§4.5)
	Medium enters sample chamber to quickly	Contact your supplier

5 ILS Guillotine G05

5.1 Technical specifications

ILS “Guillotine” 05 according ISO 5667-2&10 en NEN 6600-1	
Sample characteristics:	Principe Plunjer / Cutting device
• Sample cycle	• ± 5 sec total
• Wetted parts	• RVS 316 V4A, PTFE, Viton, POM, Silicon
• Material plunjer	• RVS 316 V4A
• Material seals	• Viton & PTFE
• Waste water temperature	• max 35°C (higher on request).
• Maximum pressure	• 2 Bar (higher optional)
• Minimal pipe diameter	• 100mm smaller use special AVM fitting
• Minimal diameter	• 14 mm
• Sample volume	• 50 ml fixed volume (optional smaller volume)
Actuator:	Pneumatic
• Air supply	• 6-8 bar conditioned
• Protection class	• IP 65
• Enclosure cylinder	• Hard Anodized Aluminium cylinder
• Air connection	• Coupling for 8mm compressed air hose
• Activation time	• 5 sec
• Response contact	• Optional
Valve: (Optional)	5/2 Valve, with NAMUR
• Power supply	• 24 VDC ±5% / 0.13A
• Current	• 0.13A
Surrounding conditions:	
• Ambient temperature	• 0,1°C tot +40°C (lower optional)
• Zone	• Not i

5.2 Maten en Onderdelen

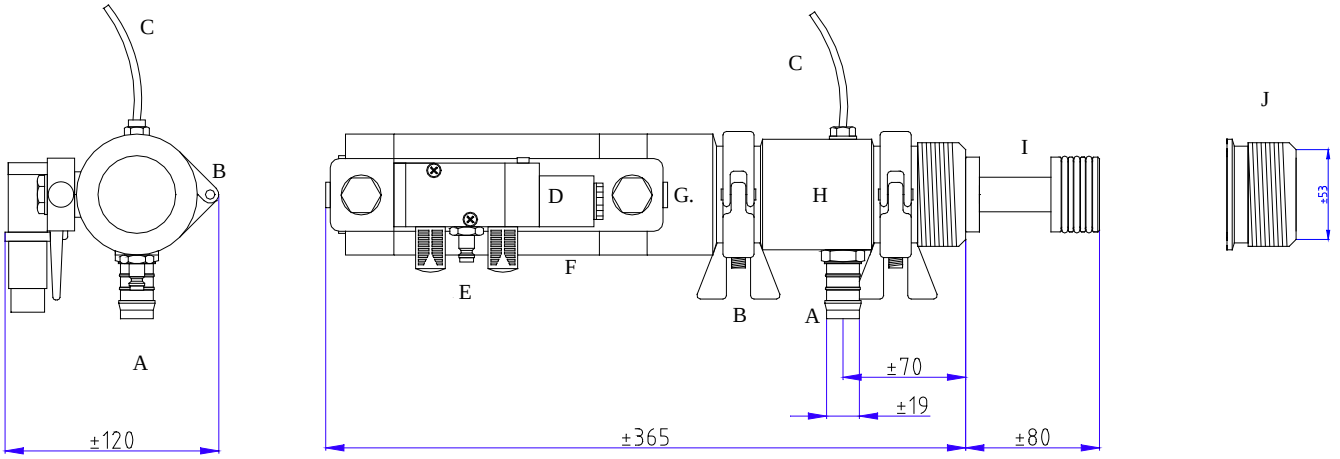


Fig. 5.2a

A) Sample drain pilar
B) RVS Tri-clamp couplings
C) Exhaust
D) Magnet for 5/2 valve (Valve is optional)
E) Air coupling
F) Cylinder
G) POM nose block
H) SS 316 Enclosure
I) SS 316 Plunjer
J) Mounting welding ridge with 2” thread

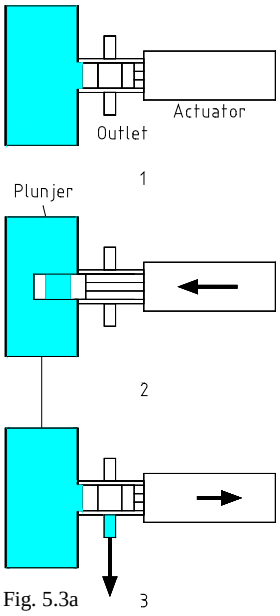


Fig. 5.3a

5.3 Principle of operation

The sampling cycle from a ILS Guillotine sampler:

- The sampler is in **standby position**, the plunjer has its cavity above the outlet.
- When the actuator is driven by compressed air the plunjer will “shoot” inward the piping and the cavity will fill with medium (**fill position**).
- After several seconds the plunjer shoots back in the enclosure and medium form the cavity drains through the outlet. After discharging the sampler is back to **standby position.**

5.4 Installation instructions

See fig. 5.4 for installation instructions, keep in mind:

- Place sampler in a 100% filled pipe free from air inclusion and in horizontal piping a minimum flow velocity of 0,5/s.
- Ensure there is enough height for the silicon hose which enters the inlet in the enclosure.
- Do not place the sampler in turns or reduces.
- For safe maintenance and reparations the sample pipe needs to be empty.
- Don’t place the sampler in or after a downward flow
- Maximum pipe pressure 2 bar
- Ensure the sampler doesn’t stick in the piping in standby position.

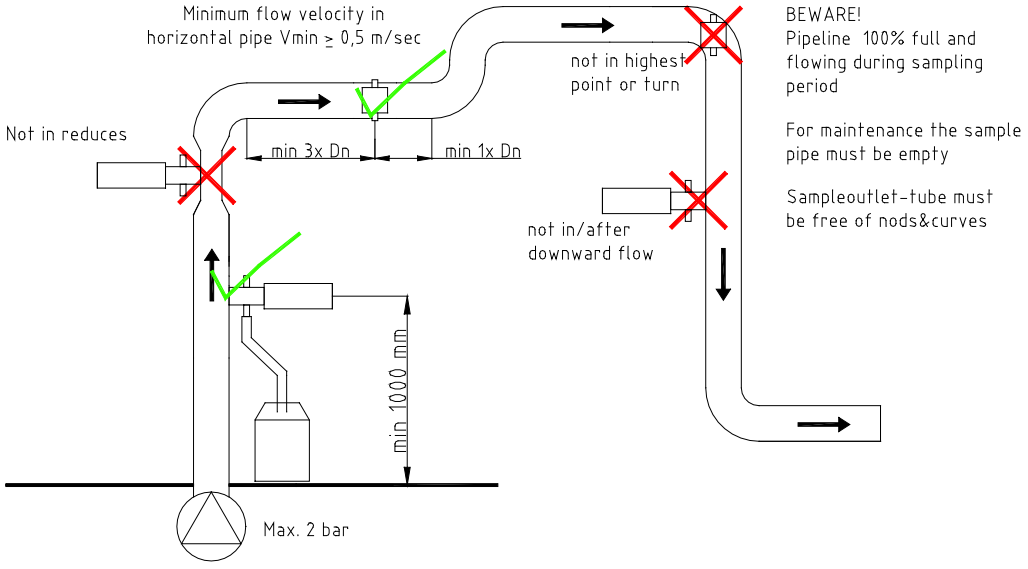


Fig. 5.4a

5.5 Changing sample volume

To change the sample volume from the ILS Guillotine Sampler the plunjer needs to be replaced. There are different plunjers with a sample volume < 50 cc available.

5.6 Maintenance

Be aware! Remove power supply, compressed air supply and medium pressure before maintenance or reparations.

Maintenance en reparations should be done by qualified personnel.

Avoid direct contact with waste water/medium, wear during use/maintenance/reparation of the sampler protective gloves

Be Aware! When removing the sample drain hose from the pincher the danger of fingers entering the pincher accurse, this can cause serious injuries.

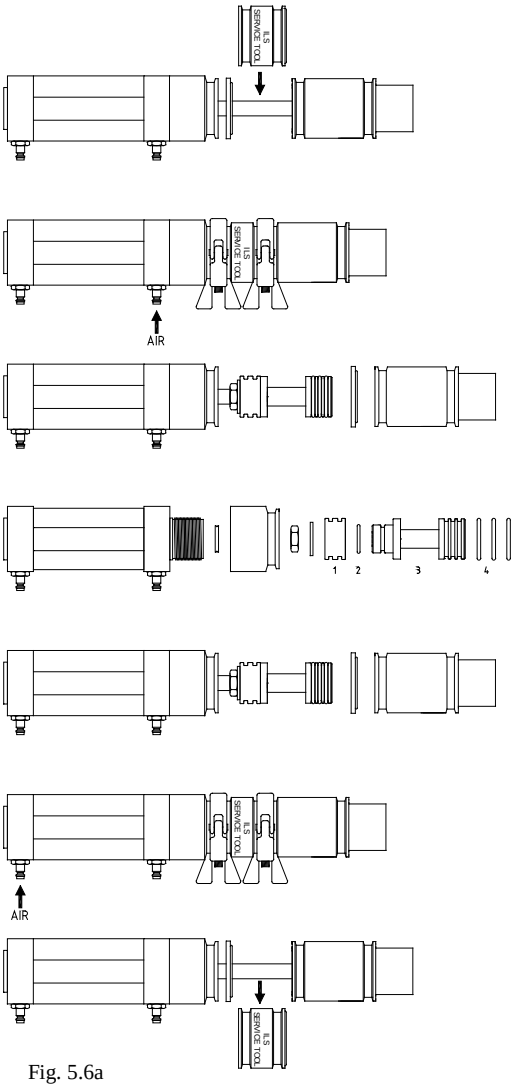


Fig. 5.6a

Maintenance:

Regular (depends on use and sample frequency) clean, or replace if necessary the plunjer, sample outlet pillar and sample drain hose with a soft brush and tap water. Regular check if the seals on the plunjer are worn.

Disassembly:

- Remove the front TRI-Clamp coupling and pull the sampler from the piping.
- Remove the 2nd TRI-Clamp coupling and pull the enclosure away from the cylinder.
- Place thee ILS-service tool around the axle and mount it with 2 TRI-Clamp couplings.
- Place compressed air on coupling B and the plunjer shoots backwards **(BE AWARE FINGERS!)**.
- Remove the ILS-service tool and pull the enclosure loose from the last seals on the plunjer.
- Loosen the locking nut from the plunjer and loosen the plunjer from the axle

Revision:

Replace the seals on the plunjer (3 in fig 5.6a),3x Viton large(4), 1 Viton small(2) and 1 Teflon(1). Loosen the black protection cover from the cylinder to replace the x-ring on the axle.

Mounting

Work opposite to the disassembly to assemble the sampler.
When placinging the seals make use some form of lubricant.

5.7 Trouble shooting

Problem	**Diagnose**	Solution
Sampler doesn't sample automatic	Check sampling settings	➔§3.5
	No compressed air	Connect compressed air
	Connector not correctly connected	Rewire connector(➔§5.4)
	Cylinder leaks air	Replace cylinder
Low sample volume	Plunjer polluted	Clean plunjer(➔§5.6)
	Sampling in a downward flow	See installation instructions (➔§5.3)
Sampler works but doesn't discharge medium	Plunjer clogged with dirt	Clean plunjer (➔§5.6)
	Sample drain outlet clogged	Clean sample drain (➔§5.6)
Sampler leaks medium from sample outlet	Leaking/worn seal /O-ringen	Replace seal / O-ringen (➔§5.6)
Sampler drops sample on activation	Air coupling wrongly connected	Switch couplings on cylinder.

6 ILS 2WE (2-Weg Electric PVC)

6.1 Technical specifications

ILS 2WE 412 conform NEN 6600-1 & ISO 5667-2&10	
Sample characteristics: • Sample cycle time • Material enclosure • Material bullet/seals • Wastewater temperature. • Maximum pressure • Minimum diameter • Sample volume	Principle 2 way rotating bullet • ±32 sec total • PVC-C • SS 316 V4A/ PTFE + Viton • max. 35°C (higher on request). • 2 bar • 13 mm • ±50 ml
Actuator: • Power supply • Current • Duty cycle • Protection class • Enclosure • Max. moment • Position-indicator • Connections • Activation time • Manual operation • Response contact	Electric • 24 VDC • 1A • 35% atj 20° C • IP 65 • Polyamide • 20 Nm max. 25 Nm • Visual • 3 P+E connector, DIN 34650 • 16 sec. + optional flush time • Yes, by position indicator • Yes
Surrounding conditions • Ambient temperature • Zone	 • 0,1°C tot +40°C (lower optional) • Not in explosion hazardous areas.

6.2 Measurements and parts

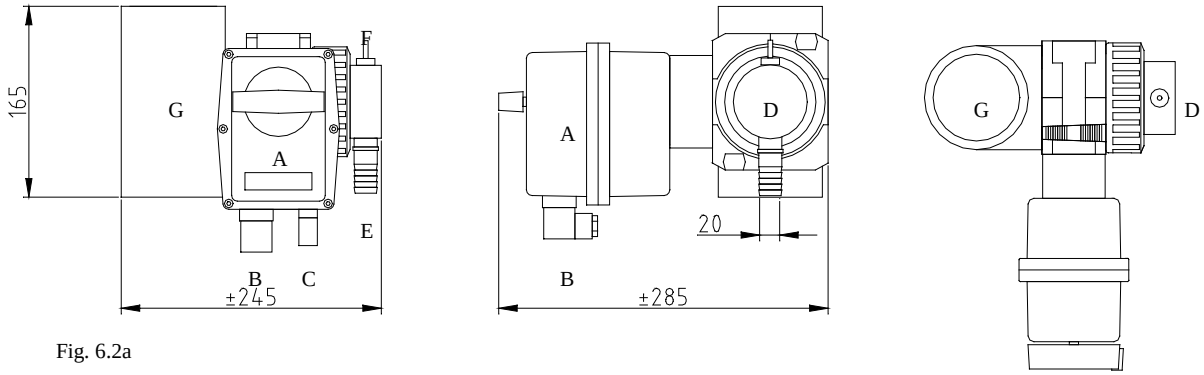


Fig. 6.2a

A) Electric actuator
B) Connector power supply
C) Connector response contact
D) End cap
E) Sample drain
F) Exhaust
G) 75mm PVC glue socket

6.3 Principle of operation

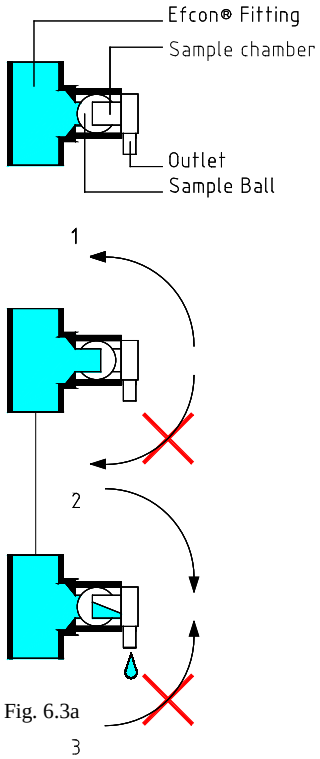


Fig. 6.3a

The sample cycle from a ILS “2W” sampler works as followed:

- Standby position sampler, the sample ball has it’s cavity pointed to the drain outlet from the sampler.
- The Sample bullet will turn 180° during activation and the cavity will fill itself with medium..
- When the activation stops, the sample bullet will rotate 180°back and drop the sample through the outlet and silicon hose to the sample container. See fig. 6.3a.

Be aware! Ensure the cavity in the sample bullet (Sample chamber) turns upside.

Manual operation

Set the switch beneath on the actuator to (B)MAN (manual) and turn the sample bullet in the sampler by turning the position indicator. Set the switch on the actuator to (A) AUTO (Automatic) for electric sampling

6.4 Installation instructions

See fig. 6.4a for installation instructions, keep in mind:

- Place sampler in a 100% filled pipe free from air inclusion and in horizontal piping a minimum flow velocity of 0,5/s.
- Ensure there is enough height for the silicon hose which enters the inlet in the enclosure.
- Do not place the sampler in turns or reduces.
- For safe maintenance and reparations the sample pipe needs to be empty.
- Don't place the sampler in or after a downward flow
- Maximum pipe pressure l 2 bar

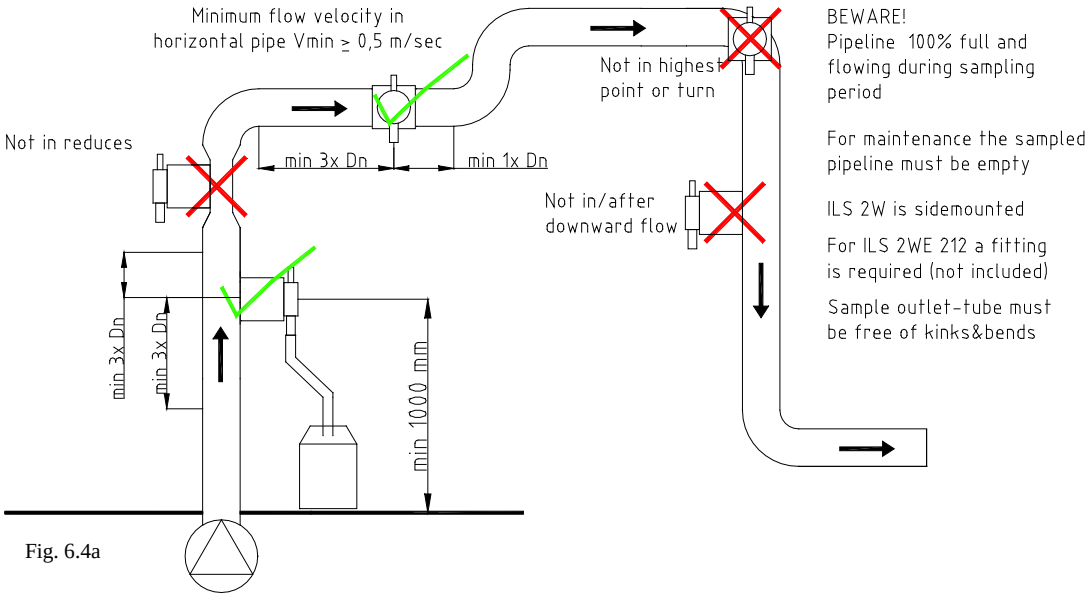


Fig. 6.4a

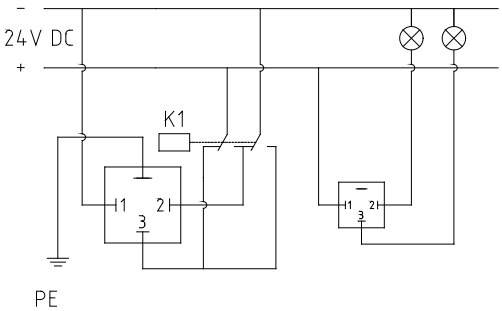


Fig. 6.4b

Electric sampler actuators:

Follow the diagram in fig. 6.4b for wiring the connectors.
The relay K1 needs to be active during ±18 sec + flush time to take a sample.

The small connector is connected to 2 cam switches (upper 2 in actuator. By removing the locking plates, the cams can be positioned

Pen 1 = Common
Pen 2 = Cam switch S3
Pen 3 = Cam switch S4

To guarantee an IP 65 protection class a power cable should be chosen with a correct diameter, check the table below:

Connector small		Connector large	
Min. diameter	Max. diameter	Min. diameter	Max. diameter
5 mm	6 mm	8 mm	10,5

6.5 Maintenance

Be aware! Remove power supply, compressed air supply and medium pressure before maintenance or reparations.

Maintenance en reparations should be done by qualified personnel.

Avoid direct contact with waste water/medium, wear during use/maintenance/reparation of the sampler protective gloves

Be Aware! When removing the end cap from the enclosure the danger of fingers entering the sample bullet accurse, this can cause serious injuries.

Points of attention

- Regular clean all parts which come in contact with waste water/medium (sample hose and inside of sampler). Remove the end cap to access all wetted parts inside the sampler.
- Clean the cavity of the sample bullet, end cap and hose tail with a soft broom.

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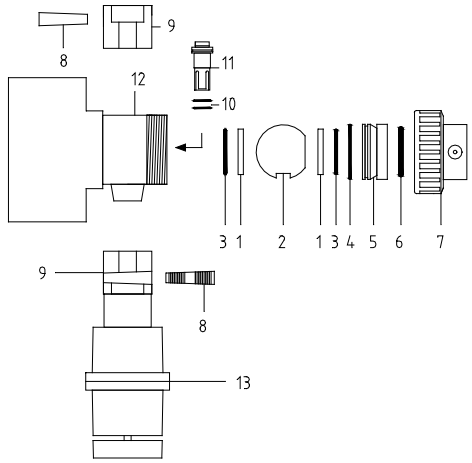


Fig. 6.5a

- Carefully remove the two wedges(8) from the valve holder(9), remove the actuator(13) from the enclosure(12).
- Loosen the end cap(7) from the enclosure. Loosen the left thread seal holder(5) with the handle from the seals set.
- Replace the seal(1) from the seal holder(8) from the enclosure and replace the seal(1) on the inside. Ensure O-rings(3) are placed behind the seals.
- Push the drive axle(11) from the ball to the inside of the enclosure and replace the 2 O-rings(10) on the axle.
- Check if the other O-ringen(4&6) still seal, if not replace them.

6.6 Trouble shooting

Problem	Diagnose	Solution
Sampler doesn't turn	No power supply	Connect power supply (➔§6.4)
	Wrong connector connection	Rewire connector (➔§6.4)
	Sampler is on Manual control	Turn switch to (A) auto
	Electric overload safety active, due to blockage	Disconnect power supply Remove blockage, connect power supply
	Defect actuator	Replace actuator
Low sample volume	Sampling in a downward flow	See installation instructions (➔§6.4)
	Sample bullet polluted	Clean sample bullet (➔§6.5)
	Sample bullet cavity not filled	Lengthen the activation contact(➔§3.5)

Sampler turns but doesn't discharge medium	Sample bullet clogged with dirt	Clean bullet / end cap (➔§6.5)
Sampler leaks medium	Leaking seal/bullet/O-rings	Replace seals, bullet/O-rings (➔§6.5)
Sampler discharges sample after 1 180° turn	Sample bullet misplaced	Open sampler, turn sample bullet 180º (➔§6.5)
No response contact	Connector wrongly connected	Rewire connector(➔§6.4)

7 ILS 3-way Pneumatic SS

7.1 Technical specifications

ILS3WP 222& 3WP 422 according NEN 6600-1&ISO5667-2&10	
Sample characteristics: • Sampler cycle time • Material enclosure • Material sample bullet • Material piping • Medium temperature. • Maximum pressure • Connection sample inlet • Diameter sample pipe • Minimum outlet diameter • Sample volume	Principle 3 way flush system • Dependable • SS 316 • SS 316 V4A • SS 316 • max 60°C (higher on request). • 2 Bar (higher optional) • G¾" / G1½ • 20 / 40 mm, other diameters on request • 14 mm • fixed volume, manually controlled
Actuator: • Air supply • Protection class • Enclosure • Max. torque • Position-indicator • Activation time • Response contact • Power supply valve • Current • Connection air supply • Exhaust • Connector	Type ILS 3WP222 Pneumatic • 6-8 bar conditioned • IP 65 • Hard Anodized Aluminium • 50 Nm • Visual (optional) • 3 sec • Optional • 24 VDC ±5% / 0.13A • 0.13A • ILS coupling 8 mm tube fitting • With silencer and exhaust regulator • DIN43650-A
Surrounding conditions • Ambient temperature • Zone	 • 0,1°C tot +40°C (lower optional) • Not in explosive hazardous area.

7.2 Measurements and parts ILS 3WP SS

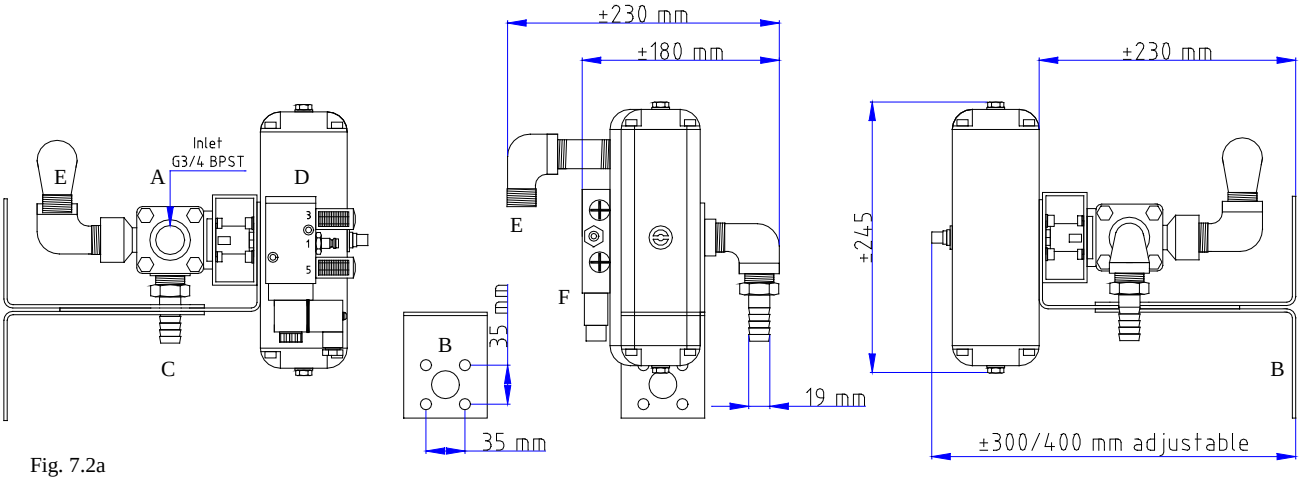


Fig. 7.2a

A) Supply pipe fitting Inlet
B) Mounting bracket
C) Pillar for sample drain
D) Pneumatic actuator
E) Flush water drain
F) Namur valve

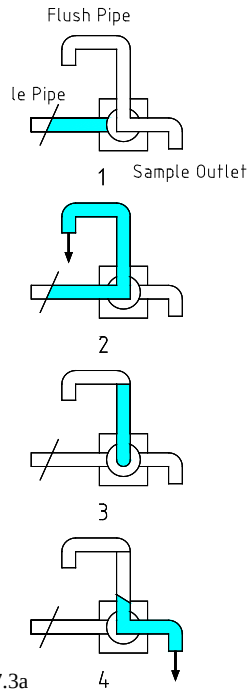


Fig.7.3a

7.3 Operation Principle ILS 3WP RVS

The sample cycle of the ILS "3W" sampler works as followed:

- **Standby position** sampler, the sample bullet has its cavity pointed to the sample outlet.
- After closure of relay contact K1 (see diagram §1.7) the sample ball will rotate towards flush position and will stay there as long contact K1 is closed. At this point the sample ball makes a passage between supply inlet and flush outlet, **flush position**.
- When contact K1 opens the sample ball will rotate back towards its rest/drain-position, the sampled medium will stay in the sample pipe.
- **Rest/drain-position** and the sample pipe will drain empty.

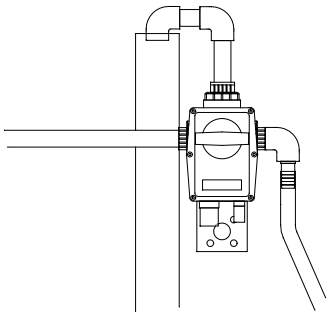


Fig. 7.4a

7.4 Installation instructions

- Mount the sampler water levelled to a vertical wall with the supplied bracket. Ensure there is enough height for a proper discharge of the sample to the container.
- Ensure a wide dimensioning of the flush pipe (minimum 50mm). **Be Aware! Flush for a representative sample min. 3x the volume of the supply pipe**
- Mount the supply pipe to a 100% filled pipe (see fig 7.4a). Keep the supply pipe as short as possible. **Be aware! The supply pipe needs to be disconnected for safe maintenance and reparations.**
- Place the sample drain hose over the hose tail from the sample outlet of the sampler. **Be aware! Keep the length of the sample drain hose as possible and free from siphons and nods.**

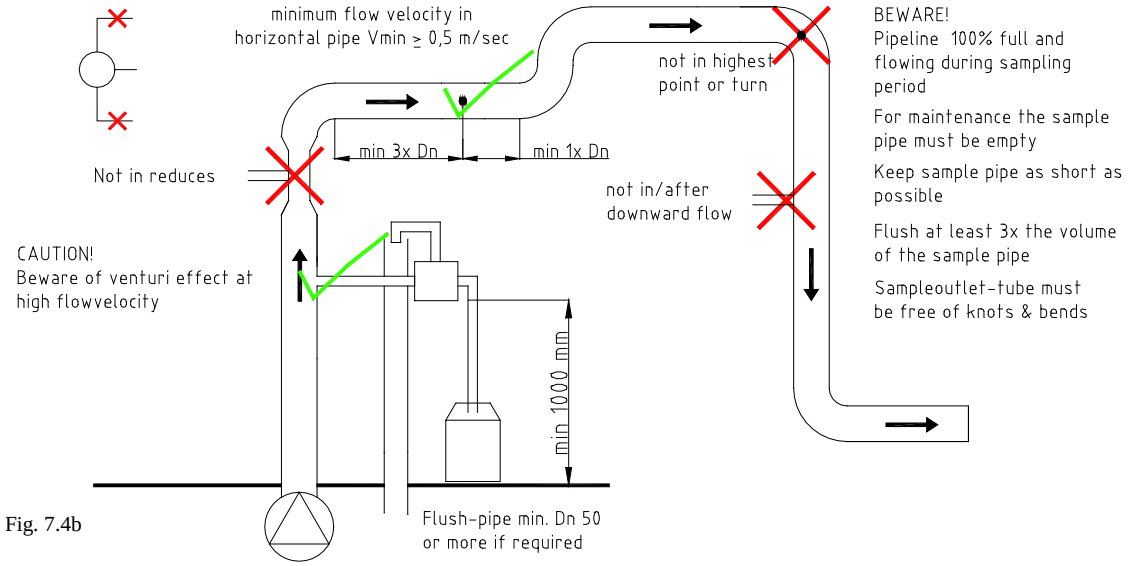


Fig. 7.4b

Be aware! Ensure the cavity of the sample bullet turns upside and in standby position the cavity is pointed to the sample outlet

7.5 Changening sample volume

Contact your supplier.

7.6 Maintenance

Be aware! Remove power supply, compressed air supply and medium pressure before maintenance or reparations.

Maintenance en reparations should be done by qualified personal.

Avoid direct contact with waste water/medium, wear during use/maintenance/reparation of the sampler protective gloves

Be Aware! When removing the inlet or outlet from the enclosure the danger of fingers entering the sample bullet accurse, this can cause serious injuries.

Point of attention

- Clean the interior from the sample bullet, piping and hose tail with a soft broom and tap water.
- Replace sample hose if necessary.
- Check air connections

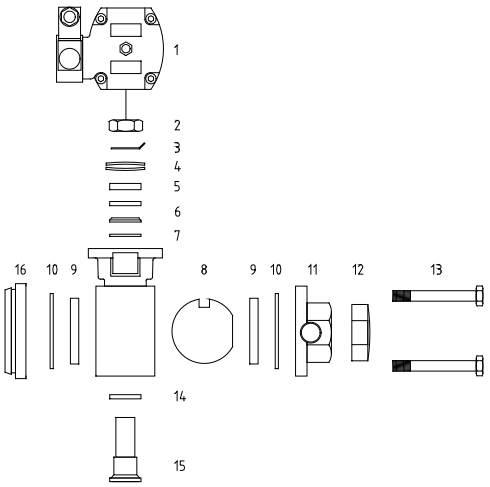


Fig. 7.6a

Revision

- Remove the actuator(1) by loosening the 4 inbus nuts beneath the actuator.
- Remove the seals(9) and turn the rotation axle(13) 90° to remove the sample ball(8) from its enclosure.
- Push the lock plate(3) loose from the nut(2), loosen the nut from the axle(15) and take the axle from the enclosure. Replace the lower seal(14) on the axle and replace the axle.
- Replace the upper seal(7) from the axle de as and the turn washers(6), place the SS ring (5) ,the 2 spanners(4), the lock plate(3) and fasten the axle with the nut(2).
- Lock the nut by bending the lock plate backwards. Replace the 2 seals(10).
- Reassembly the sampler and check operation.

7.7 Trouble shooting ILS 3WP RVS

Problem	Diagnose	Solution
Sampler doesn't turn	No compressed air supply	Connect air supply(➔§1.7)
	Connector wired wrong	Connect wiring(➔§1.7)
	Defect actuator	Replace actuator
Low sample volume	Bullet clogged	Clean bullet (➔§2.2)
	Sampling in a downward flow	Installation error (➔§1.5)
Sampler turns without discharging medium	Drain outlet clogged	Cleanse drain outlet (➔§2.2)
	Bullet clogged	Cleanse bullet (➔§2.2)
Sampler leaks medium	Leaking seal/bullet/O-rings	Replace seal, bullet/. O-rings (➔§2.2)
Sampler discharges sample after a 180° turn	Bullet installed wrong	Open sampler and turn the sample bullet 180º.

8 ILS 3 way PVC

8.1 Technical specifications ILS 3WE PVC

ILS 3WE 212 according NEN 6600-1 & ISO 5667-2&10	
Sample characteristics:	Principle 3 way flush system
• Sample cyclus time	• ±32 sec + flush time
• Material enclosure	• PVC-C
• Material piping	• PVC-C
• Material bullet / seals	• SS 316 V4A / PTFE + Viton
• Waste water temperature.	• max. 35°C (higher on request)
• Maximum medium pressure	• 2 bar
• Minimum diameter	• 13 mm
• Sample volume	• 50 ml fixed volume (optional other volumes)
Actuator:	Electric
• Power supply	• 24 VDC
• Current	• 1A
• Duty cycle	• 35% at 20° C
• Protection class	• IP 65
• Enclosure	• Polyamide
• Max. moment	• 20 Nm m 25 Nm
• Position-indicator	• Visual
• Connections	• 3 P+E connector, DIN 34650
• Activation time	• 16 sec. + optional flush time
• Manual operation	• Yes, by position indicator
• Response contact	• Yes
Surrounding conditions	
• Ambient temperature	• 0,1°C tot +40°C (lower optional)
• Zone	• Not in explosion hazardous areas.

8.2 Measurements and parts

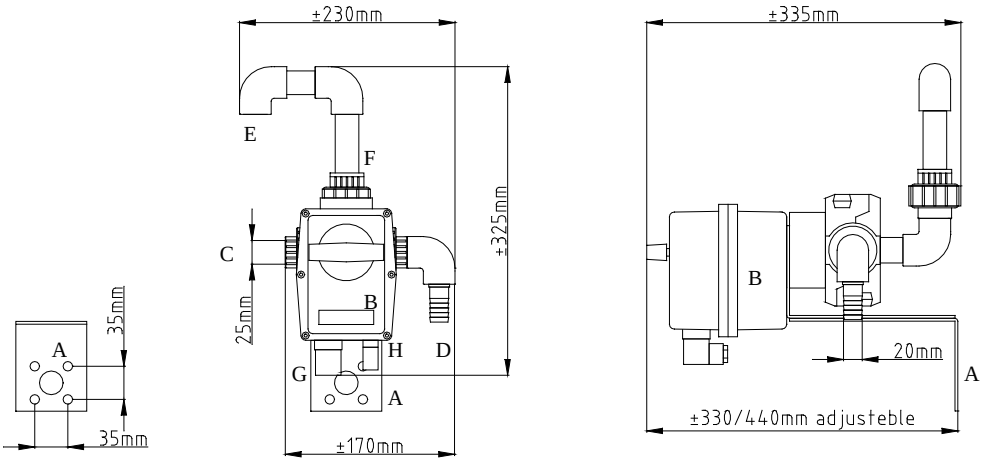


Fig. 8.2a

A) SS mounting bracket
B) Electric actuator
C) Supply PVC socket 25mm (supply pipe)
D) Sample drain 20mm hose tail
E) Flush water drain PVC 25mm socket
F) Sample tube with 3-piece-coupling
G) Connector power supply
H) Connector response contact

8.3 Principle of operation

Check H7.3.

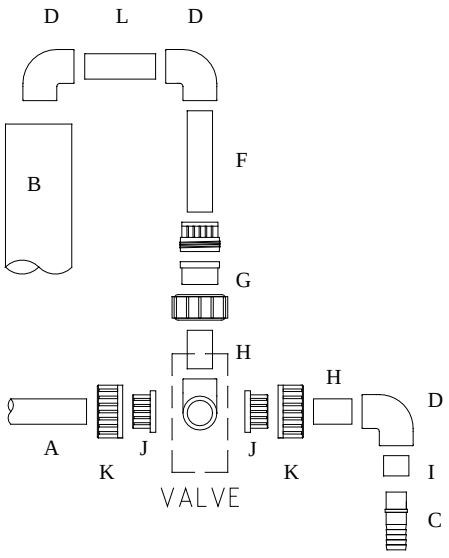


Fig. 8.3a

8.4 Installation instructions

Glue the sampler together with PVC-C-glue according fig 8.3a, glue according specifications from the glue manufacturer. Be aware, in standby position the sampler bullet has its cavity pointed to the sample outlet.

A) Supply pipe (PVC 25/20)
B) Flush water pipe min 50mm
C) Hose tail for sample drain
D) Bend piece (PVC d25)
E) Pipe (PVC d25/L68)
F) Sample pipe (PVC 25/20 /L100) transparent
G) 3-piece coupling (PVC 25/20)
H) Pipe (PVC 25/20 /L39)
I) Reduce (PVC 25/20/16)
J) Collar (PVC 25/20)
K) Nut (PVC)

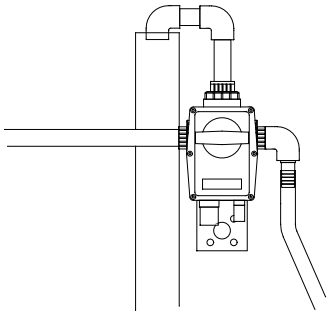


Fig. 8.3b

- Mount the sampler water levelled to a vertical wall with the supplied bracket. Ensure there is enough height for a proper discharge of the sample to the container.
- Ensure a wide dimensioning of the flush pipe (minimum 50mm). **Be Aware! Flush for a representative sample min. 3x the volume of the supply pipe**
- Mount the supply pipe to a 100% filled pipe (see fig 7.4a). Keep the supply pipe as short as possible. **Be aware! The supply pipe needs to be disconnected for safe maintenance and reparations.**
- Place the sample drain hose over the hose tail from the sample outlet of the sampler. **Be aware! Keep the length of the sample drain hose as possible and free from siphons and nods.**

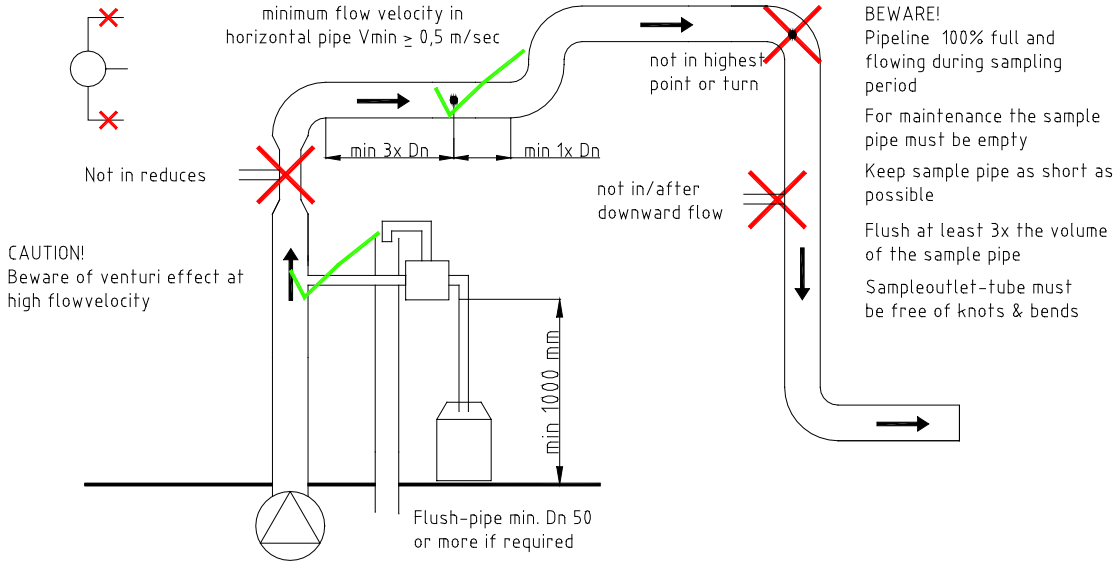


Fig. 8.3c

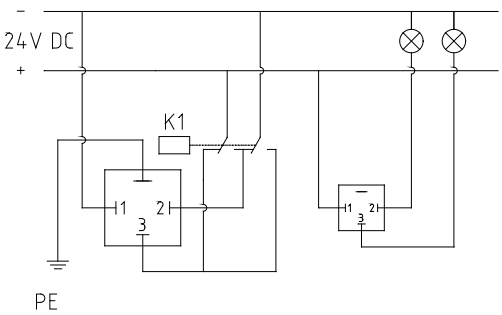


Fig. 8.3d

Electric sampler actuators:
Follow the diagram in fig. 6.4b for wiring the connectors.

Activate relay K1 is during ±18 sec + flush time to take a sample.

The small connector is connected to 2 cam switches (upper 2 in actuator. By removing the locking plates, the cams can be positioned .

Pen 1 = Common
Pen 2 = Cam switch S3
Pen 3 = Cam switch S4

To guarantee an IP 65 protection class a power cable should be chosen with a correct diameter, check the table below:

Connector small		Connector large	
Min. diameter	Max. diameter	Min. diameter	Max. diameter
5 mm	6 mm	8 mm	10,5

8.5 Changing sample volume

Contact your supplier.

8.6 Maintenance

Be aware! Remove power supply, compressed air supply and medium pressure before maintenance or reparations.

Maintenance en reparations should be done by qualified personnel.

Avoid direct contact with waste water/medium, wear during use/maintenance/reparation of the sampler protective gloves

Be Aware! When removing the inlet or outlet from the enclosure the danger of fingers entering the sample bullet accurse, this can cause serious injuries.

Points of attention

- Clean the interior from the sample bullet, piping and hose tail with a soft broom and tap water.
- Replace sample hose if necessary.
- Check air connections

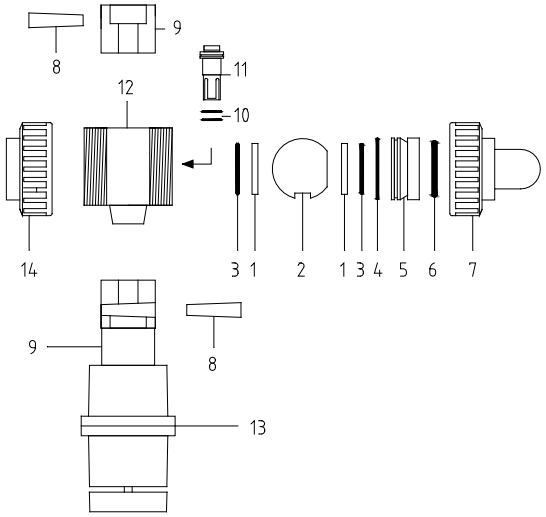


Fig. 8.5a

Revision ILS 3WE

- Carefully remove the 2 wedges (8) from the valve holder(9) and remove the actuator(13) from the valve enclosure(12).
- Loosen the inlet and sample outlet (7) from the enclosure
- Loosen the left threaded spanner (5) with the handle supplied with the sealset.
- Replace the seal(1) from the spanner(8). Remove the sample bullet(2) from the enclosure en replace the seal(1) on the inside.
- Be aware the O-rings(3) are replaced behind the seals.
- Push the axle (11) from the bullet to the inside, take it out and replace the O-rings(10) on the axle.
- Check if other O-rings(4&6) need replacements.

8.7 Trouble shooting

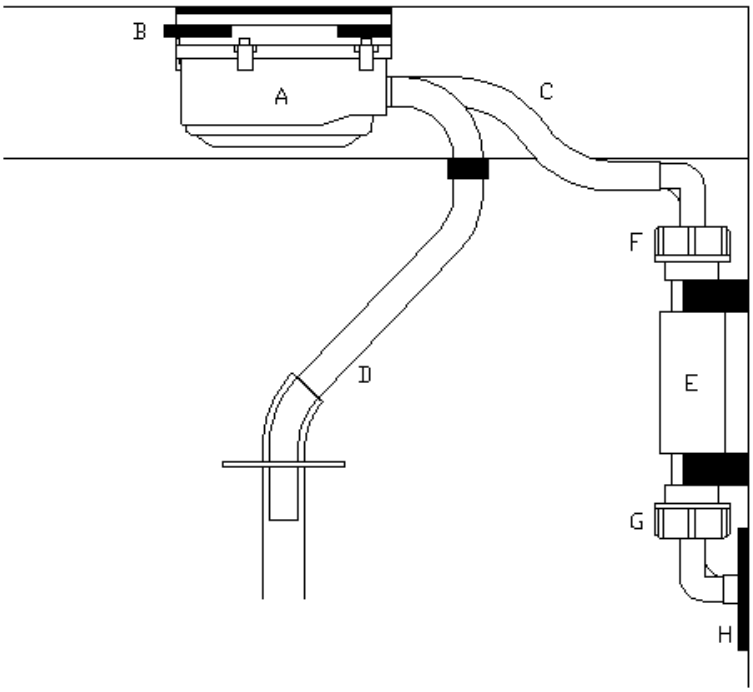
See §6.6 en §7.7.

9 Peristaltic sampler

9.1 Technical specifications Peristaltic

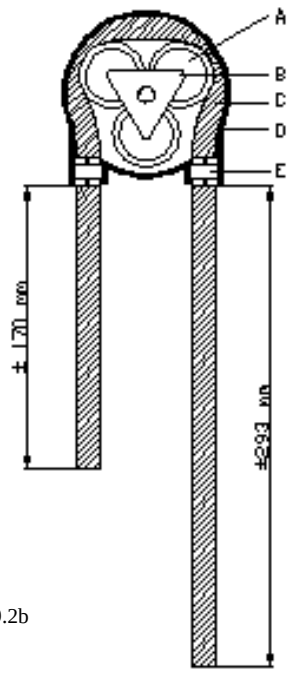
Peristaltic pump	
Sample characteristics: • Sample cyclus time • Material enclosure • Material tubing • Dimensions tubing • Waste water temperature. • Maximum medium pressure • Maximum suction height • Suction velocity • Tubing life time • Suction hose	Peristaltic • ±32 sec + flush time • POM • Norprene© • 9,5 x 2.4 • max.50°C (higher on request) • 5 m H_2O • 5 m H_2O • 0,6m/s at 4m height • 200 hours (depending medium) • standard 5m included
Peristaltic pump • Power supply • Current • Duty cycle • Max. moment • Connections	Electric • 24 VDC • 1,5A • 35% at 20° C • 20 Nm - 25 Nm • Molex 2 pole

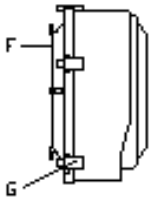
9.2 Measurements and parts



A) Pump body
B) Quick release pomp body
C) Intake tubing
D) Outlet tubing
E) Medium detector
F) Intake tubing coupling
G) Suction hose coupling
H) Inlet for suction hose

Fig. 9.2a





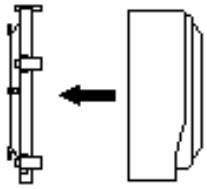


Fig. 9.2b

A) Rollers
B) Roller holder
C) Tubing
D) Pump body
E) Tubing clip
F) Pump lid
G) Spring clip

9.3 Principle of operation

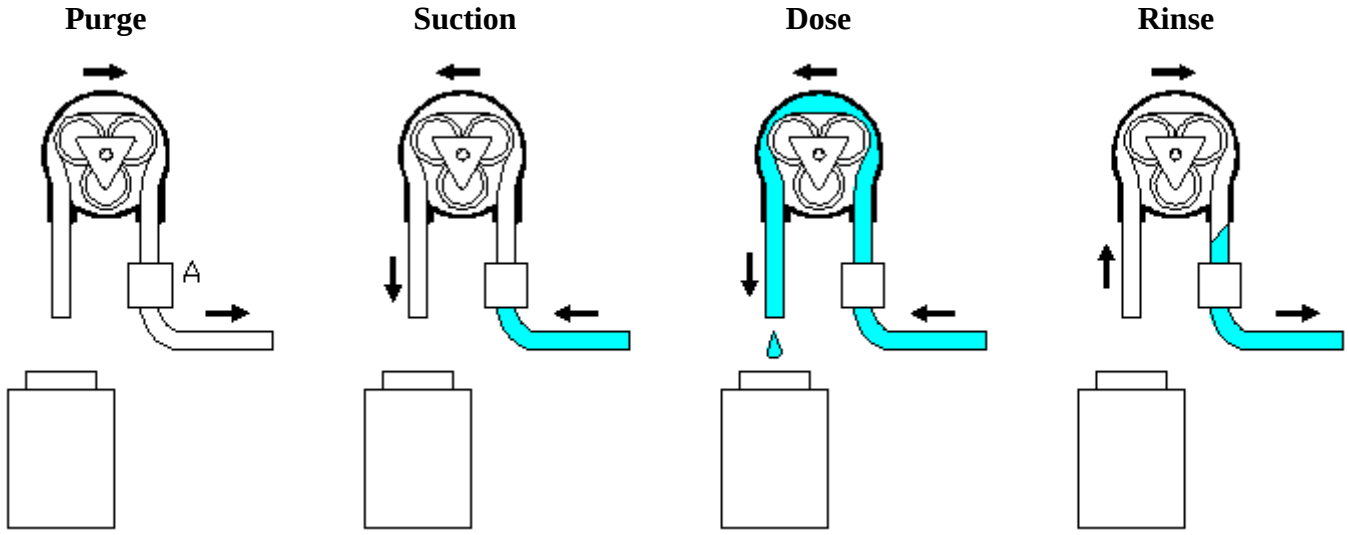


Fig. 9.3a

1) **Purge:** When taking a sample the sampler starts purging the suction hose during a set time (parameter PurgeT, default 10 seconds). This is to remove the old medium from the suction hose trough the inlet.
2) **Suction:** The samplers starts creating a vacuum on the inlet until medium reaches the medium detector (A in fig 8.3).When the sampler doesn't detect medium within a set time (parameter Suction, default 30 seconds) an error sample is counted.
3) **Dose:** After the medium is detected the sampler doses the medium during a set time (Dose time: 6 seconds default).
4) **Rinse:** When a sample is dosed the peristaltic pump creates pressure again on the inlet to rinse all the excess water from the tubing inside the pump and suction hose all during a set time (Parameter RinseT, default 10 seconds).

9.4 Installation instructions

Follow the following procedures during installation

- Connect the suction hose to the supplied suction hose coupling. Connect the coupling to the medium detector. Feed the hose through the inlet and fasten the gland air tight.
- Mount the end (inlet) of the suction hose on a fixed representative turbulent point to sample homogeneous waste water. Ensure the suction hose is always emerged in the waste water/medium.

Keep in mind:

- Maximum suction height: 8 meter
- Maximum suction length: 30 meter

9.5 Changing the sample volume

To change the sample volume, change the Dose time with parameter DoseT. To increase the sample volume lengthen the dose time.

⚠ **Beware: Changing the suction hose length or diameter will changing the suction velocity, which changes the sample volume as well.**

9.6 Maintenance

⚠ **Be aware! Remove power supply, compressed air supply and medium pressure before maintenance or reparations.**

⚠ **Maintenance en reparations should be done by qualified personnel.**

Avoid direct contact with waste water/medium, wear during use/maintenance/reparation of the sampler protective gloves

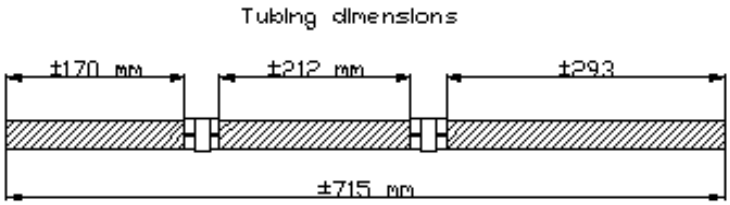
⚠ **Be Aware! When removing the inlet or outlet from the enclosure the danger of fingers entering the sample bullet accurse, this can cause serious injuries.**

Points of attention

- Clean the interior of the medium detector, piping and coupling (all wetted parts) with a soft broom and tap water, on a regular basis. The interval depends on the sampled medium.
- Replace suction hose if necessary.
- Check condition of the tubing inside the pump, replace when necessary.

Replacing the tubing inside the pump body

- Loosen the tubing from the detect block and silicon hose.
- Remove the pump body from the sampler by pressing the quick release to the right.
- By carefully pressing (by hand) the clips on the side of pump body you can remove the lid from the body to access the tubing.
- Remove the rollers and holder and take out the tubing.
- Remove the tubing-clips
- Cut new tubing with the dimensions shown below



- Place the tubing clips with the correct spacing in between.
- Replace the tubing and rollers inside the pump body
- Close the pump body with the lid
- Replace the pump inside the sampler
- Restore the tubing connections
- Take a sample and check if everything functions

9 Spare parts

Recommended spare parts

	Art. code	Description	SL1…	SL2…	SL3…	SL4…	SL5…	SL6…
1	SIL-21x15	Silicon sample hose (meter)	•	•	•	•	•	•
2	FUSE 250V T5A	Fuse T3,15A	•	•	•	•	•	•
3	FUSE 250V T3.15A	Fuse T5A	•	•	•	•	•	•
4	KEY-333	Key for Doorlock	•	•	•	•	•	•
5	SCC 001	Sample Container 1 litre	•	•	•	•	•	•
6	SCC 002	Sample Container 2 litre	•	•	•	•	•	•
7	SCC 013	Sample Container 13 litre	•	•	•	•	•	•
8	SCC 018	Sample Container 18 litre	•	•	•	•	•	•
9	SCC 020	Sample Container 20 litre	•	•	•	•	•	•
10	SCC 025	Sample Container 25 litre	•	•	•	•	•	•
11	SCC 050	Sample Container 50 litre	•	•	•	•	•	•
12	CON-A4P	Pulse input/alarm output connector	•	•	•	•	•	•
13	VS-PRB-4mwk	Pump rotor block + 3x Rotor discs	•					
14	VS-PRBH-4mwk	Pump rotor block holder	•					
15	VS-PRB-6MWK	Pump rotor block + 4x Rotor discs	•					
16	VS-PVC-21x16	PVC suction hose 16 mm (standard)	•					
17	VS-PVC-18x13	PVC suction hose 13 mm	•					
18	VS-CSH-16	Connector for 16mm suction hose	•					
19	VS-CSH-13	Connector for 13mm suction hose	•					
20	VS-GLASS-02	Sample Chamber Glass (Borosilicate)	•					
21	VS-PC-06	Sample Chamber Polycarbonaat	•					
22	ILS 60-P-SEAL	ILS Guillotine revision seals		•				
23	ILS-G05-SEAL	ILS Guillotine 05 revision seals		•				
24	AIR-5/2-VALVE	5/2 Valve for pneumatic samplers		•	•		•	
25	ILS-2W-SS-SEAL	ILS 2WP SS revision seals			•			
26	ILS-2W-PVC-SEAL	ILS 2WE PVC revision seals				•		
27	ILS-3W-SS¾-SEAL	ILS 3WP SS ¾" revision seals					•	
28	ILS-3W-SS1½-SEAL	ILS 3WP SS 1½" revision seals					•	
29	ILS-3W-PVC-D25-SEAL	ILS 3WE PVC D25/dn20 revision seals						•

Spare parts

	Art. code	Description	SL1…	SL2…	SL3…	SL4…	SL5…	SL6…
1	DISTR-ENG	Distributor engine	•	•	•	•	•	•
2	FAN-ISO-24V	Fan inside isobox 24VDC	•	•	•	•	•	•
3	TEM-ISO-TAR	Temperature controler	•	•	•	•	•	•
4	VS-PIN-06	Smartpinch valve model 2006	•					
5	VS-PUMP-5MWK	Vacuum pump 5 mWk	•					
6	VS-PUMP-7MWK	Vacuum pump 7 mWk	•					
8	ILS-G05-SERVICE-TOOL	ILS Service tool		•				
9	ILS-G05-P20CC	ILS Plunjer 20 cc sample volume		•				
10	ILS-G05-P50CC	ILS Plunjer 50 cc sample volume		•				
12	ILS-G05-ACT	ILS Guillotine 05 actuator		•				
13	ILS-RESPONSE	ILS Guillotine response contact		•				
15	ILS-2/3WP-ACT	ILS 2/3 WP Pneumatic actuator			•		•	
16	ILS-2WE-BALL	ILS 2WE sample ball				•		
17	ILS-2/3WE-ACT	ILS 2/3WE 24 V actuator				•		•

10 CE-declaration

Declaration of conformity with EC directives,

AVM b.v.,
Nieuwe weg 3B
4126 RN Hei- en Boeicop, Netherlands
Phone +31-347 342 777
Web site: www.efconomy.com
E-mail: info@avm-efcon.nl

Manufacturer of Effluent Control Systems,

Declare under our responsibility for manufacture and supply the

Efcon®omy type _ _ _ _ _ _ _ Serial Number _ _ _ _ _ software Version SL_ V_ _ _ _ _ _ _ _ _ _

To which this declaration relates, are in conformity with following directives

Electrical according NEN-EN-IEC 60204-1

Mechanical according 98/37/EG

CE Label according 93/465/EEG module A

It is not allowed to use the product for any other purposes than described in the manual.

P. Verkroost
Man. Dir. AVM b.v.

Original signed copy is added to the product.

Date _ _ - _ _ - _ _ _ _